BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 29 1938

STATES OF DEPRESSION: THEIR CLINICAL AND AETIOLOGICAL DIFFERENTIATION *

BY

AUBREY LEWIS, M.D., F.R.C.P.

Clinical Director and Lecturer on Psychiatry, Maudsley Hospital

Classification and diagnosis have been so derided in psychiatry that the subject of our discussion to-day is almost a shady one. No doubt the shadow under which it lies comes also from the solid difficulties, which are plain when any of the current ways of differentiating between depressions are applied to a series of cases. It is, I think, at all events correct to say that (although a fair amount has been written) no fresh light has been cast on the subject for several years, since it is much easier to show the inadequacy of proposed methods than to substitute for them a useful and valid one. Useful and valid are the two epithets which any classification should deserve. In considering them the opportunities and difficulties can be brought into clearer view.

Valid Classification

The usefulness of a classification will vary according to who uses it. One that serves the clinician well may be of little value to the research worker: it may even make his task harder. The clinician wants classes into which he can put his patient's illness after a reasonably brief period of investigation, and which will assist him to make a prognosis and decide on treatment. So long as the classes do this, it does not matter how illogical, psychologically or pathologically unsound, and expressive of his own idiosyncrasies they may be: they provide him with extra knowledge of the sort he wants, and he does not care whether they represent his own, more or less incommunicable, experience or the fruits of others' study. The man who treats patients only in private practice may find a classification useful which the physician in the mental hospital regards as illusory, and the latter may use one which the consulting-room psychotherapist detests or cannot understand: both these classifications may be useless to the general practitioner. If all three physicians had the same clinical material and problems they would no doubt come to use the same classification; but at present they do not, although they may use the same words for their classes: to realize this one has only to compare the letters sent by each of them when referring depressed patients to an out-patient clinic. Because of the peculiar phenomena of mental disorder, so much harder to describe in agreed conventional terms than those of other illnesses, it is customary for clinicians to use their words, and their classes, with an individual twist. This is what distinguishes them from those of the research worker. He wants his classes, and his words, to have some fixity, so that he can generalize and summarize and communicate his observations: he cannot work in circumstances where the case that he calls an endogenous melancholia another man may call a reactive depression, and a third man call a paranoid schizophrenic. He may be satisfied if he can delimit a class of depressions in which the only distinguishing feature common to all members of the class is some chemical anomaly, even though for the clinician this turns out to be a woefully heterogeneous group. Many quarrels about the justness of classifications in psychiatry are usually due to these differing needs of the clinician and the research worker. In an ideal state of knowledge the schism would end, but that is still a distant time.

It might seem that validity is here merely a synonym for usefulness. But classifications may be useful for the wrong ends: they may be used to separate off cases which are regarded—wrongly—as hopeless, or as needing a particular type of treatment; the clinician may never come to see how vicious are the uses to which he has been, contentedly, putting his classification. The research worker, on his side, may have delimited classes of which the characteristic is irrelevant to his problem, much as though he were to divide depressives into those with and those without naevi, or those whose parents had hernia and those who had not. A valid classification is one which is not only useful, but useful for sound medical or scientific ends. It is necessary to see how far the available classifications are valid in this sense.

The first task of classification is obviously to recognize the depression itself. This is too often taken to be a diagnostic act. It should be concerned with nothing further than description of the emotional state. Any person who is unhappy, and ill with his unhappiness, may properly be said to be in a state of depression. To lay down other criteria for a depression is to raise fundamental problems. For convenience we may restrict the term to those states of depression in which we cannot discover any other significant illness—for example, schizophrenia, cerebral tumour, arteriosclerosis. But the elimination of these is the second task. It is common ground that depression may be the conspicuous or the only clinical evidence of almost any mental illness at some stage: everyone will

* Read in opening a discussion in the Section of Neurology and Psychological Medicine at the Annual Meeting of the British Medical Association, Plymouth, 1938.

aim at spotting the G.P.I., say, or cerebral tumour, or schizophrenia which hides behind a depressive front. What is more, the psychiatrist cannot dismiss this depressive front as a false one, a screen, but has to consider how far it stands for an independent contribution to the total illness. It is at this point that the clinician's private notion of depression creeps in, bringing confusion. If he regards "true" depression as an endogenous illness, of good prognosis, and itself recognizable, he will be interested to see whether this patient's depression conforms to his notion of "true" depression, in which case, if there is also another disorder present, such as a schizophrenic or an obsessional one, he says, "We have here a mixed picture": or he may regard this depression as the normal response to the abnormal situation created by the concomitant, or screened, illness, and may dismiss it as secondary and rather irrelevant. In short, the moment description is deserted, at the second stage of the classifying process, influences get to work which are often only in part consciously recognized as such by the clinician, though they may greatly modify his decisions.

Hereditary and Environmental Factors

The most popular classification is, on the surface, an aetiological one. It says that there are depressions due to heredity (autonomous, autogenous, endogenous, manic-depressive, cyclothymic, vital, constitutional, are among the words employed) and others due to the environment (psychogenic, exogenous, extraneous, reactive, psychoneurotic). But this is purely theoretical. We have no means of detecting such causes satisfactorily, except in a minority of cases. Moreover, as theory it is bad. It derives from the days when Nature and nurture could be contrasted in an epigram. It assumes that heredity commonly operates with that high probability of manifestation which we see in Huntington's chorea or the height of sweet peas: and that environment can work on an almost illimitably plastic and responsive human organism. As biology has moved beyond these excessively simple views, and recognizes that hereditary and environmental factors commonly interact, it is reactionary to uphold them in the case of a depressive illness, especially when it is so extremely difficult to determine the relative importance of hereditary and environmental factors in any such case. It is probably true that in some depressions the hereditary factor vastly outweighs the environmental, and that in others the reverse is the case, but to detect such cases we have only dubious means—study of the parentage and sibship, observation of the bodily habit, assessment of the relation between the outbreak of the illness and the external factors which might have conduced to it. In the present state of knowledge these are dubious means when applied to the individual case, though they serve well enough for the analysis of a collection of cases, statistically. The number of cases in which critical and experienced psychiatrists with different theoretical standpoints would be found to agree that the hereditary factors were almost certainly responsible for the attack (or, in the alternative instance, that environmental ones were) is, I believe, so small that the subjectiveness of many of our judgments on this matter can scarcely be gainsaid. There are some cases in which a recent distress seems to account for the depression, which is then properly called a reactive one, but since profound melancholia or mania may likewise ensue upon a sorrow, reactivity does not mean only psychogenesis. The more thorough the analysis that can be made of the life of the patient, and of his responses to circumstances, the stronger is one's inclination to attribute his morbid behaviour mostly to post-natal influences; genetic studies have the opposite effect. There is no reliable evidence as to the heredity of so-called psychogenic depression; and as for the other varieties, what has been reported does not justify distinctions upon a hereditary basis.

Differentiation by Study of Symptoms

A differentiation that can be made by study of the symptoms is of value to the practising physician. When he sees a patient who has fits it is more convenient for him to run over in his mind the differential points given in the textbook tables than to inquire at length into the previous personality, make an encephalogram, etc. At any rate he tries the short method first, preparatory to further search. If he could similarly separate forms of depression he would not be put off by any uncertainty about causes. I have taken a very recent table of the sort: the author says that the differences between neurotic and manic-depressive depression are usually clearly marked: they lie in the constancy of the depression during the attack: the patient's ability to be amused by a joke, to weep, or to appreciate beauty; his interest in himself and his surroundings, his self-reproach, his good health in the period before or between attacks, and his admission that he is ill. Also it is said that in manic-depressive depression "the patient gets well obviously spontaneously. He has been unresponsive to all therapeutic efforts, and the doctor is never given the impression that he has done anything." Nothing could better illustrate what I said earlier about the personal and partly incommunicable value of the classification which a particular clinician may find useful. The psychiatrist quoted works very satisfactorily with a scheme which to me is useless: when I try to apply it it fails, because the same cases will fall on one count into the left-hand side of the table and on another count into the right-hand side. It is true that when first seen in the out-patient department cases often seem to me to fall readily into one or the other category, but when they are gone into more fully in the course of treatment this facility of classification turns out to have been spurious. And I take it that this is partly because my notions of spontaneous or aided recovery, of variability and responsiveness in the depression, and so forth, are not those of the author of the table. Also it is because of a disagreement about facts: patients with severe self-reproachful depression sometimes weep, sometimes even laugh, sometimes worry about their relatives, are mildly depressed and anxious between attacks, or admit that they are ill; patients with chronic reactive depression may be self-reproachful, incapable of appreciating beauty, and never weep. Moreover, in a series of cases I have lately looked through for the purpose, illnesses that fulfil all these clinical requirements of a reactive depression have occurred preceding an acute mania and a severe involutional melancholia, either as an initial stage or as a previous attack (in my earlier published series the same sequence can be found): some of them have been treated as such psychotherapeutically, and with benefit, in previous attacks. Even this shows only how useless the scheme is to me: not that it is generally useless. Actually it is a question of how many patients fit comfortably into either group, so characterized. As is fairly plain in the series I reported, I find that few do; Curran reaches the same conclusion. I think these groups are extreme types rather than clinical realities: a few others, however, find good reason to hold the contrary view. Clouston, who believed in the importance of a distinction (between "melancholy" and "melancholia"), put the matter quite simply in 1904: "Typical cases exhibiting these two conditions are totally different and distinguishable, and the only excuses for confounding them are that they shade off

into each other, that we have no absolutely definite scientific test to distinguish them, that they are both in many cases the outcome of the same temperament and diathesis, and that they both have something of the same nature, both psychologically and physiologically." These are good excuses. Probably there are genuine differences between cases of mainly hereditary causation and those in which environmental causes predominate, possibly also between cases with different kinds of hereditary causation, but the clinical differences given in such tables as I have mentioned do not at present serve to distinguish them. And it is well to remember, as Newman has recently concluded from his studies, that in many ways what heredity can do environment can also do.

There is another such table which includes bodily features—anorexia, constipation, loss of weight. Muncie has stressed the sleep disturbance. Various writers have thought that metabolic variations, especially in respect of nitrogen and carbohydrate metabolism, occur in manic-depressive depression and not in reactive depression. Such claims have not been substantiated as yet. When classes can be separated which are marked by significant somatic differences, it will have the advantage that trained observers will presumably be able to agree as to the presence or absence of these somatic characteristics in any patient.

In recent contributions to the subject emphasis is variously laid upon periodicity, concomitant depersonalization or anxiety and tension, sleep, personality, heredity, psychopathology, and somatic pathology (Rouart, Muncie, Titley, Schnitzenberger, Brockhausen, Montassut, Anthonisen, Schilder, Armenise, Lorand, Baruk and Gevaudan, Georgi, etc.). But periodicity would be more valuable if it could be demonstrated to be a frequent characteristic, whereas actually it is rare; recurrence is of course a different thing, and may be no more indicative of an intrinsic rhythm, a biological periodicity, than is a series of colds in the head; it may indicate recoverability only. As for the anxiety or tension depressions, they cannot be made to form a homogeneous group, for they have only the phenomena of the anxiety attack in common, all the rest being expressible in terms of mild and severe, or proportions of fear and misery. Personality and heredity have not so much cast light on involutional melancholi as left it in a penumbra. Twin studies should, of course elucidate the whole problem, but until Dr. Slater's materiai is published nothing is available on this aspect of the classification of depressive states. Psychopathology is as variabie as ever in its voices, and no somatic changes are of sufficient definiteness and constancy to be the basis or the buttress of a differentiation.

Distinction between Reactive and Manic-depressive Varieties

Apart from some English writers, it is difficult in the literature of the last five or even ten years to find support for any sharp distinction between reactive and manic-depressive varieties of depression. But a distinction of this sort is often implied in what is written, especially (if it may be said without offence) in the more elementary presentations, in which an almost entirely hereditary psychosis is kept remote from the "neurasthenia" of year-long neurotics and the mourning and unhappiness of those who have lost something of immense emotional value to them. Moreover, in many writings the intelligibility of the occurrence is taken as a criterion: if the physician can enter into the patient's feelings and understand the illness as the natural outcome of situations in which the patient has been, then he calls it psychogenic or reactive; if he cannot, then he calls it autonomous (thus Adolf Meyer talks of a "true simple melancholia, or 'unjustified depression'"). No doubt this too is a personally valuable way of reviewing the illness, but it has the disadvantages already mentioned as attaching to such subjective judgments. For psycho-analysts it is out of the question, because of the universally explanatory value of their views and method.

There could be no more convincing evidence of the way classifications epitomize theory, and can be serviceable for very limited groups while worthless to others, than the psycho-analytical classification put forward by Glover. Psycho-analytical work in the field of depression during the last few years (for example, Schilder, Klein) has shed as little light on the topic of this discussion as have published studies in heredity, psychology, or somatic pathology.

It is very probable that all the tables and classifications in terms of symptoms are nothing more than attempts to distinguish between acute and chronic, mild and severe: and where two categories only are presented, the one—manic-depressive—gives the characteristics of acute severe depression, the other of chronic mild depression. I am using acute and chronic as temporal words, and mild and severe as indicating the degree of the overt mental disturbance. This, if recognized for what it is, is a useful division, provided the vulgar error is avoided of thinking that every manic-depressive should get well inevitably and spontaneously, and that every case of reactive depression calls for intensive psychotherapy which, if well given, should bring recovery. It also rather fails to provide for the acute mild and the severe chronic cases, which are numerous.

The danger of these classifications, for the clinician, lies in two directions. First there is the assumption, just alluded to, that when a patient's illness seems to fit into the manic-depressive category there is nothing to be done but to fold one's arms in resignation, or, at most, to employ "reassurance and safeguarding" until he gets better of his own accord; and, alternatively, that if it falls into the other group, psychotherapy, and nothing but psychotherapy, will restore him to active life. Treatment should be based on a knowledge of the patient's constitutional qualities and the stresses he has met, not on a schematic and rigid plan, a short cut to the wrong shop. Secondly, it is dangerous because it says, as one of these tables does, that in reactive depression suicide is "sometimes talked but not attempted." Now and again there appears in the account of some inquest the evidence of the doctor who had concluded that it was "only a neurotic depression," and had his views confirmed by a psychiatrist, who found no sign of a "genuine psychosis." Of course, everyone makes mistakes in assessing the likelihood of suicide, and it is quite possible that in these cases the suicide would have occurred anyhow, since one cannot send into a mental hospital every doubtful case of suicidal risk. And, again, it may be conceded that in the hands of some clinicians this method of assessing the risk of suicide works very well. But it is surely bad when that immensely important question of suicide can be disposed of in the practitioner's mind by reference to a classification that creaks at the joints, and is applied differently by different people. Classifications cannot take the place of experience, or of knowledge of one's patient, of the depth of his despair, and the strength of his impulses.

Involutional Depression

These are the two varieties of depression chiefly dwelt upon in textbooks and articles. Attention is also paid to

involutional depression. Thus, one authority speaks of five varieties: constitutional depression, prolonged neurasthenic malaise, true simple melancholia, depressive delusion with intense fear, and catatonic melancholia (but the last two are, of course, usually involutional, and the first covers Reiss's group of 1910, now swallowed up in the reactive group). It is true that some features common in involutional melancholia are rare in other forms of depression, but since these probably depend on the patient's age and on degenerative cerebral disease (often of the vessels), or on schizophrenic admixture, it does not seem necessary for classification to stress them as such, but rather to use the patient's age as the sole reason for calling the depression "involutional," and to seek for further data which will illuminate the prognosis and treatment.

The necessity for making sure that a depression is not due to G.P.I., pernicious anaemia, or other organic disease is present to everyone's mind. But it is less often remembered that the discovery of hysterical, obsessional, or other psychopathic trends in the patient may be important too. A very depressed young woman may be troubled by the thought that she has injured her child through leaving pins about which he could swallow; the obsessional component in this needs examination. A depression in a patient aged 50 may be accompanied by many hysterical symptoms; if the patient has most of his life shown nothing hysterical in his behaviour the possibility of a cerebral arteriosclerosis must then be reckoned with. Or a depression may be found to have developed in a person of schizoid personality, and to be ushering in a schizophrenia. Depression is a very ready psychic response; hence it cannot be evaluated and pigeon-holed without a survey of the patient's life. It was not for lack of instances to support their view that the psychiatrists of the last century believed that most mental diseases began with a stage of depression.

Conclusion

The classification, or avoidance of classification, which I would propose is: first, to determine whether the depression is severe or mild—melancholia or neurasthenia, descriptively speaking; and, of course, there are many grades. Next, does it depend on physical disease, and, if so, how completely? What happened in any previous attacks? On what discoverable influences does it depend: age; constitutional morbid trends; lifelong environmental factors, recent more acutely disturbing ones? What, in sum, is the presumptive balance of environmental forces responsible for the illness as against inherited ones; and what is the balance between environmental influences that may be modified for the better and those that are irremediable? Has the morbid condition been going on long enough to have, so to speak, established an autonomy, set up bodily and mental habits that are inveterate? Have the patient's character and surroundings worked to his advantage or disadvantage during the illness? These are points to weigh rather than points on which to classify; matters of clinical judgment, not solely of observation. A classification can, however, be built upon them. It is because we have no sure means of distinguishing exactly the numerous causes in each case, and their effects, that we must deny ourselves the ease of a simple classification: I think it is a deceptive ease and a deceptive simplicity. No doubt increasing knowledge will bring an improved, eventually even a stable, classification based on aetiology, and pointing, it may be hoped, to treatment: whether it comes by way of genetics, psychology, or somatic pathology, it will be welcome so long as it is useful and valid.

THE CLINICAL SIGNIFICANCE AND ESTIMATION OF BLOOD VITAMIN B_1

BY

EIRWYN N. ROWLANDS, M.D., B.Sc.

Assistant Director, Department of Clinical Investigations and Research, Royal Infirmary and University of Manchester

AND

JOHN F. WILKINSON, M.Sc., Ph.D., M.D., F.R.C.P., F.I.C.

Honorary Physician and Director, Department of Clinical Investigations and Research, Royal Infirmary and University of Manchester

Vitamin B_1 has been used therapeutically in many diseases, but only in beriberi is there overwhelming evidence of its importance. Therapeutic successes, however, have been claimed in nearly all forms of neuritis; thus, Russell (1936) and others have reported dramatic improvement in patients with subacute combined degeneration of the spinal cord following parenteral administration of vitamin B_1 concentrates. We, however, have failed to obtain such striking responses in a series of patients suffering from the disease in varying degrees of severity, although partial relief was noted in a few; a similar series of patients treated in the usual way with liver extracts or preparations of hog's stomach showed much more satisfactory improvement.

Writers on nutrition differ noticeably in their views of the incidence of vitamin B_1 deficiency; thus, whereas Hutchison and Mottram (1936) state that "it is in the perversity of things that food faddists have raised more to-do about vitamin B_1, which few, if any of us, lack," Vorhaus (1937) and McCarrison (1936) have remarked on the relative frequency of this deficiency, McCarrison writing that "the insufficient ingestion of vitamin B_1 is a common food fault."

Our disappointing results in subacute combined degeneration of the cord, the difficulty of assessing the value of vitamin B_1 in this disease, and the many statements that these patients are deficient in vitamin B_1 led us to investigate the possibility of estimating satisfactorily the state of vitamin B_1 nutrition in a series of normal subjects and in patients. The vitamin B_1 content of a diet is not easily estimated from a list of its constituents, and Williams (1938) considers that it is impossible to do so from the available data with an error of less than 50 per cent. Biological assay and the chemical methods so far employed are not sensitive enough to measure the minute quantities present in blood. Roscoe (1936) attempted to estimate the urinary excretion of the vitamin, using for a test the cure of neuritis in rats, but concluded that the method was of little value, while Harris and Leong (1936) have used the rat bradycardia technique.

Test for Vitamin B_1 in Blood

It appeared possible that a satisfactory test for vitamin B_1 in blood might be based upon Schopfer's discovery (1935) that the growth of the mould *Phycomyces blakesleeanus* was proportional within certain limits to the amount of vitamin B_1 present in the medium. By plotting the weight of mycelium obtained against the quantity of vitamin B_1 added, a smooth curve could be produced, and Schopfer used this as a quantitative test for vitamin B_1 in foodstuffs and animal tissues. We have employed Schopfer's technique and applied it to the

estimation of the vitamin B_1 content of human blood; our method is very similar to that since described by Meiklejohn (1937), details of which were kindly made available to us by Professor R. A. Peters. The test we used was as follows:

Technique of the Method Used

Two series of flasks are set up: (1) *The standard range*, containing medium to which known amounts of vitamin B_1 up to 0.5 µg. per flask have been added; and (2) a similar range of flasks into which are placed duplicated quantities of 1, 2, and 3 c.cm. respectively of the blood under investigation.

The medium for the standard range of flasks is dextrose (0.556 M), asparagine (0.030 M), magnesium sulphate (0.002 M), potassium dihydrogen phosphate (0.011 M); but only half the amount of asparagine is put into the blood-containing flasks. Oxalated blood is used, and the blood-containing flasks are allowed to stand for several hours to allow the corpuscles to form a firm cake at the bottom. The contents of all the flasks are adjusted to *p*H 6.5 to 6.7 by adding N/10 NaOH and then sterilized by autoclaving. After inoculation with 0.2 c.cm. of a spore suspension of *Phycomyces blakesleeanus* (containing not less than 1,000,000 spores per c.cm.) they are set aside in the dark at a temperature of 20° C. for ten days, when the mycelia are removed, washed, and dried at 110° C. for two hours. The weights of mould in the standard range are plotted against the amounts of vitamin B_1 added and a smooth curve is drawn through the points on the graph. The vitamin B_1 content of the blood can then be read off on this graph from the weight of mycelium obtained similarly with the blood samples. It is unfortunately necessary to construct a fresh graph for the standard range with each series of estimations. Thus, in Case 11 the standard range was as in Fig. 1.

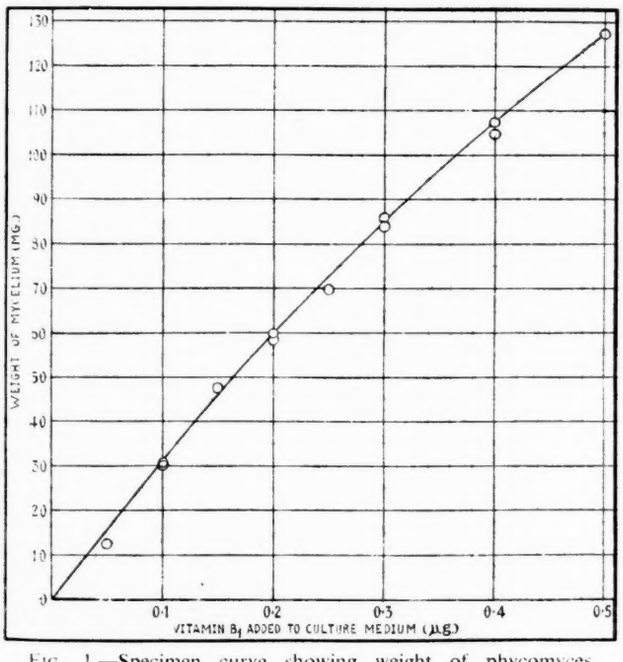


FIG. 1.—Specimen curve showing weight of phycomyces obtained with known amounts of vitamin B_1.

The weights of mycelia, using 1, 2, and 3 c.cm. of this patient's blood, were 22, 44, and 65 mg. respectively, which from this graph give 7, 7.1, and 7.3 µg. per 100 c.cm.

Evidence in Support of the Method

In spite of the fact that this method may not estimate the vitamin in its natural state in the blood but possibly only its hydrolytic disintegration products, it appears to give a good estimate of the vitamin B_1 content of the blood. There is much experimental evidence in support of this view: (1) The only factor other than vitamin B_1 that has been shown to affect the mould growth is the concentration of nitrogen in the medium; allowance can be made for this. (2) The addition to the medium of a mixture of the two fission products of vitamin B_1—namely, 4-amino-5-aminomethyl-2-methylpyrimidine and 4-methyl-5-oxyethylthiazol (kindly supplied by Professor A. R. Todd)—permits the mould to grow as effectively as with the vitamin B_1 itself. (3) The addition of vitamin B_1 to blood, at least in small amounts, usually increases the growth of mycelium to the same extent as would be produced by the same quantity of vitamin B_1 in the absence of blood. (4) The growth-promoting factor in blood resembles vitamin B_1 in that it is completely destroyed by heat at *p*H 9. (5) The growths obtained using 1, 2, and 3 c.cm. respectively of blood give values for the vitamin B_1 content per 100 c.cm. that agree within the limits of experimental error for the test. (6) Meiklejohn has shown that blood from pigeons fed on vitamin-B_1-deficient diets gives much less growth than that from normal pigeons. (7) We have found that blood withdrawn after intramuscular injection of pure vitamin B_1 into a non-deficient subject produces a greater growth of the mould, the increase starting about ten minutes after the injection and falling to normal within approximately one hour.

It is not yet possible entirely to exclude the presence of other limiting factors in blood, but the values given by duplicate estimations correspond reasonably, and the error for the test is apparently less than 10 per cent.

Normal Controls

Having established the fact that this phycomyces test gives a fairly reliable method of estimating vitamin B_1, we determined the standard range for normal blood, taken from healthy members of the departmental staff, who gave figures ranging between 6.5 µg. and 16.5 µg. per 100 c.cm. of blood. Meiklejohn obtained a range of 6.5 to 14 µg. in a series of six estimations on human blood. We have therefore considered the normal range to be 6.5 to 16.5 µg. per 100 c.cm. of whole blood (Table I).

TABLE I.—*Estimations carried out on Normal Subjects*

Initials	Sex	Age	Vitamin B_1 in µg. per 100 c.cm. blood*
A. N.	M	40	7.5
E. P.	F	26	9.5
L. E.	M	29	16.5
B. P.	M	25	7.5
T. J.	M	31	7.0 7.0
W. B.	M	17	8.2
S. C.	M	33	6.7
E. B.	F	24	6.5 7.0

* Each figure is the average of duplicate estimations on 1, 2, and 3 c.cm. of blood respectively.

Vitamin B_1 in Disease

Estimations have also been carried out on a series of patients suffering from a variety of diseases, including those in which a deficiency of vitamin B_1 has been said to be an important aetiological factor (Fig. 2; Table II).

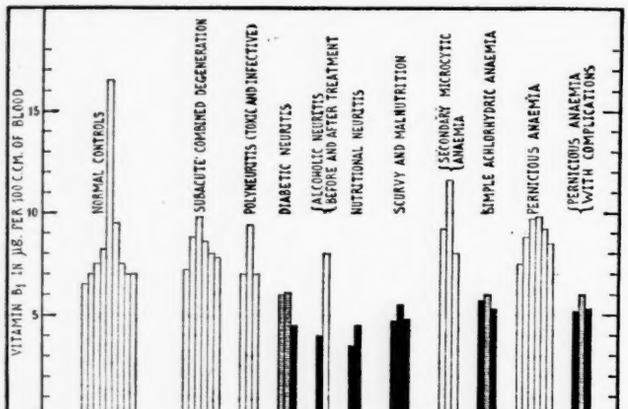


FIG. 2.—Blood vitamin B_1 in normal controls and patients.

Black columns = Deficient patients (vitamin B_1 present in deficient amount). Shaded columns = Intermediate group. Unshaded columns = Normal (vitamin B_1 present in normal amount).

I. Vitamin B_1 and the Nervous System

The study of beriberi and experimental investigations in animals have established beyond doubt an intimate and fundamental relation between vitamin B_1 and the nervous system; it is therefore natural that the vitamin has proved of most value in neurological conditions, particularly neuritis and polyneuritis. It has been claimed that the histological changes in the central nervous system in human beriberi are indistinguishable from those of toxic, especially alcoholic, polyneuritis, but recent work by Davison and Stone (1937) indicates that the pathological changes in the nervous system of rats suffering from inanition are essentially the same as those in animals deprived of vitamin B_1 or vitamins B_1 and B_2; these changes are the same whether the animals are starved with or without the administration of vitamins B_1 and B_2.

ALCOHOLIC NEURITIS

The most striking therapeutic results have been obtained in cases of alcoholic neuritis, and there are now many claims for its efficacy in this condition (Vorhaus, 1937; Jolliffe and Colbert, 1936). Although most of the clinical observations were not adequately controlled, the recent careful investigation by Goodhart and Jolliffe (1938) has confirmed the good results. Moreover, the patients can be cured in spite of continuing the intake of alcohol.

There is considerable evidence supporting the view that this condition is attributable to lack of vitamin B_1 rather than to a specific toxic action of the alcohol on nervous tissue. For example: (*a*) Alcohol does not hasten the onset of beriberi and actually delays the onset of symptoms of polyneuritis in rats. (*b*) The clinical and pathological manifestations of alcoholic polyneuritis are strictly comparable to those of beriberi (Minot *et al.*, 1933); transitional cases occur in which more definite symptoms of beriberi develop (Weiss and Wilkins, 1936). (*c*) There is evidence of dietary neglect in those alcoholics who develop nervous symptoms (Jolliffe *et al.*, 1936; Minot *et al.*, 1933; Alsted and Lunn, 1938). (*d*) There is evidence of defective assimilation in alcoholics. (*e*) Storage in the liver is probably defective in alcoholics, and it has been claimed that the irritant effect of alcohol on the stomach and liver causes vitamin deficiency. (*f*) There is evidence of increased tissue demand for the vitamin in alcoholics.

TABLE II.—*Estimations carried out on Patients with Various Diseases*

Case No.	Sex	Age	Disease	Vitamin B_1 in µg. per 100 c.cm. blood
1	F	50	Alcoholic neuritis before treatment	4.0
			After treatment	8.0
2	M	47	Polyneuritis (toxic)	9.4
3	M	61	,, (infective) ..	7.0
4	F	52	,, (toxic)	7.0
5	F	48	Subacute combined degeneration of the cord, untreated	9.8
6	M	62	,, ,, ,,	8.8
7	M	51	,, ,, ,,	8.6
8	M	65	,, ,, ,,	7.8
9	F	53	Subacute combined degeneration of the cord, treated	++
10	M	55	,, ,, ,,	8.0
11	M	47	,, ,, ,,	7.2
12	M	16	Diabetic neuritis	6.1
13	F	61	,, ,, ...	6.0
14	M	52	,, ,, (coma) ..	4.5
15	F	45	Nutritional neuritis	3.5
16	F	48	,, ,, ...	4.5
17	M	62	Malnutrition	4.7
18	M	69	Scurvy	5.5
19	M	62	,, ...	4.8
20	F	46	Simple achlorhydric anaemia ..	6.0
21	F	55	,, ,, ,, ..	5.7
22	F	48	,, ,, ,, ..	5.3
23	F	38	Secondary microcytic hypochromic anaemia	11.6
24	F	42	,, ,, ,,	9.2
25	F	58	,, ,, ,,	8.0
26	F	48	Pernicious anaemia	9.8
27	M	55	,, ,, ...	9.7
28	M	58	,, ,, ...	9.2
29	M	62	,, ,, ...	8.8
30	F	63	,, ,, ...	8.5
31	M	38	,, ,, ...	7.5
32	F	61	Pernicious anaemia + diabetic neuritis	6.0
33	M	59	Pernicious anaemia + carcinoma	5.3
34	M	59	Pernicious anaemia + furunculosis	5.2
35	F	58	Peptic ulcer	8.0
36	M	31	,, ,, ...	6.0
37	F	24	Thyrotoxicosis	7.1
38	F	39	,, ...	5.4
39	F	34	,, ...	5.0
40	F	35	Addison's disease	11.0
41	M	19	Eunuchoid infantilism ..	5.4
42	M	16	Diabetes mellitus	6.1
43	F	61	,, ,, ...	6.0
44	M	52	,, ,, (coma) ..	4.5
45	M	64	Arteriosclerosis	7.4
46	F	67	Hyperpiesis	6.8
47	F	40	,, and malnutrition ..	5.5
48	M	23	Heart failure	7.5

Alcoholic neuritis appears to be more intimately associated with vitamin B_1 deficiency than any other form of neuritis apart from beriberi; it is relatively very uncommon in this country, and is rarely seen in hospital patients.

One female patient (seen through the courtesy of Dr. F. R. Ferguson), who was known to have taken two bottles of whisky daily for many years, suffered from polyneuritis and Korsakoff's psychosis. Several estimations of the blood vitamin B_1 gave values of only 4 μg. per 100 c.cm. That the patient's symptoms could be attributed to the deficiency of vitamin B_1 was supported by the marked improvement in both her neurological and her mental condition after the institution of a course of injections of crystalline vitamin B_1 (4 mg.) thrice weekly. She now has a normal vitamin B_1 value of 8 μg. per 100 c.cm.

NON-ALCOHOLIC POLYNEURITIS

In recent publications it has been suggested that vitamin B_1 acts specifically in cases of neuritis of the most divergent aetiology: Vorhaus (1937) claimed complete disappearance of all symptoms in 90 per cent. of 250 cases, and in 70 per cent. of cases of localized neuritis improvement occurred in spite of the presence of septic foci. He concluded that "the action of vitamin B_1 in neuritis bears a close analogy to that of iron in anaemia." Russell (1936) recorded dramatic improvement in an old-standing case of chronic progressive polyneuritis; similar results have been claimed by many other workers.

We examined three cases of non-alcoholic toxic or infective polyneuritis and found blood vitamin B_1 values of 7, 7, and 9.4 μg. per 100 c.cm. respectively, which are well above lowest normal values. Treatment, however, with vitamin B_1 failed to produce any improvement.

SUBACUTE COMBINED DEGENERATION

As already mentioned, vitamin B_1 has been claimed to produce very good results, even complete remission, in these cases. We have been unable to confirm this, and poor therapeutic responses in this disease after vitamin B_1 have also been reported by other workers (Sciclounoff and Broccard, 1936; Fouts *et al.*, 1932, etc.). We found that in seven patients the blood vitamin B_1 was normal, ranging between 7.2 and 9.8 μg. per 100 c.cm.

DIABETIC NEURITIS

Two patients with diabetic neuritis were not significantly deficient (6 and 6.1 μg.), but a third one had a definitely low blood vitamin B_1 value (4.5 μg.); this latter patient was in a state of mild diabetic coma.

NUTRITIONAL NEURITIS

Two patients with neuritis due to a definite nutritional deficiency were examined; they showed complete recovery after suitable treatment with normal diet and added vitamin B_1.

The first patient, a woman aged 45, had suffered from neuritis and hyperpiesis for two years; she had complained of flatulent dyspepsia, vomiting, constipation, and anorexia, and had greatly restricted her food intake: in attempts to control the vomiting she never ate eggs, fruit, or vegetables of any kind, and had actually been taking little else but tea and biscuits. There was no evidence of organic disease other than a severe hypochromic microcytic anaemia, achlorhydria, and a subnormal blood vitamin C value (0.16 mg. per 100 c.cm.); her blood vitamin B_1 was the lowest obtained in this series, being only 3.5 μg. per 100 c.cm. of whole blood. Another woman, aged 48, had complained of paraesthesiae and ataxia for some nine months; she had suffered from long-standing anorexia and was obviously undernourished. There was no evidence of organic disease, but she had a moderate hypochromic microcytic anaemia and hypochlorhydria. Examination showed absence of all deep reflexes and disturbances of sensation in the lower limbs. Her blood vitamin B_1 was only 4.5 μg. per 100 c.cm.

II. Vitamin B_1 and Anaemias

In view of the fact that many types of anaemia are essentially nutritional deficiency diseases, and of the probable coincident deficiency of vitamin B_1, the importance of improving the general nutrition of the patient cannot be emphasized too strongly. Nevertheless Davidson (1931), using yeast in a series of different types of anaemia, obtained good results in only one case, while yeast preparations are only in exceptional cases effective in pernicious anaemia, as we also have noted. Wills (1931) found marmite effective for tropical macrocytic anaemia, but as its efficiency is not destroyed by previous autoclaving it cannot be due to the vitamin B_1. Elsom (1937) reported eight cases of macrocytic anaemia in pregnant women who responded to brewers' yeast orally and to liver parenterally; the clinical disturbances appeared when calculations based upon Cowgill's (1934) formula indicated a deficiency of vitamin B_1.

We examined the blood from *six untreated cases of pernicious anaemia* without spinal cord involvement. They formed a representative group of patients with typical uncomplicated pernicious anaemia taken from a series of over 1,000 cases; the blood vitamin B_1 values (7.5 to 9.8 μg. per 100 c.cm.) were all within the normal range. On the other hand, the blood from three cases of pernicious anaemia with complications gave much lower values, which clearly depend on the complicating disease.

The first patient, a woman aged 61, had a diabetic neuritis (blood vitamin B_1, 6.0 μg.); the second, a man aged 59 who had been under adequate control and treatment with hog's stomach for three years, had a normal blood count and was suffering from severe furunculosis; his blood vitamin B_1 value was only 5.2 μg. The third patient, also a man aged 59, had been under treatment for eight years, and although his blood count was normal he complained of a recent and sudden onset of difficulty in breathing with hoarseness and loss of weight: examination showed an inoperable carcinoma of the larynx. His blood vitamin B_1 value was 5.3 μg. per 100 c.cm.

Three female patients with *nutritional iron deficiency (achlorhydric) microcytic anaemia* had the typical symptoms and signs associated with achlorhydria; their haemoglobin percentages and colour indices were low and they responded completely to intensive iron therapy; the blood vitamin B_1 values were 6, 5.7, and 5.3 μg. per 100 c.cm. of blood respectively—definitely below the accepted minimum of the normal range. It is well known that this type of patient often shows other concurrent dietetic deficiencies, so that low values for the blood vitamins B_1 and C (Portnoy and Wilkinson, 1938) are commonly found.

Microcytic hypochromic anaemia secondary to other diseases, however, gave normal values, as might be expected in the absence of any nutritional deficiency. Thus three patients, in whom the anaemia directly followed (1) haematemesis from duodenal ulcer, (2) peptic ulceration, (3) severe menorrhagia, had blood vitamin B_1 values of 8, 9.2, and 11.6 μg. per 100 c.cm. of blood respectively.

Three patients with *malnutrition* had definitely low values for vitamin B_1 in the blood.

Two of these patients were indigent males (aged 62 and 69 years respectively) suffering from very severe scurvy: they were grossly undernourished and neither had taken fresh food of any kind for many months, having eaten only poor quality bread, margarine, tea, and very occasional small portions of meat. They both had most extensive ecchymoses and widespread purpura, particularly of the legs, arms, and face, and haemorrhages from the mucous membranes. Plasma ascorbic

acid determinations showed gross deficiencies (Portnoy and Wilkinson, 1938), in one instance (Case 18) the plasma vitamin C content being less than 0.1 mg. per 100 c.cm. The vitamin B_1 contents of the blood in these two cases were 4.8 and 5.5 μg. respectively. Both patients responded dramatically to treatment with intravenous administration of ascorbic acid and full normal diets. The third patient (Case 17) in this group had taken a poor diet for many years and was obviously much undernourished, but he did not show any evidence of scurvy; the vitamin B_1 content of his blood was only 4.7 μg. per 100 c.cm.

III. Vitamin B_1 and Cardiovascular and Kidney Disease

Cardiovascular disorders are common and often important features in beriberi, and there is evidence that the heart returns to a normal condition when adequate amounts of vitamin B_1 are given. Weiss and Wilkins (1936) have reported a series of alcoholic patients displaying severe cardiac failure, which they attribute to an unbalanced food intake, particularly lacking in vitamin B_1; they claim that minor degrees of circulatory disturbance due to vitamin B_1 deficiency are often seen.

During the course of this investigation we did not encounter any patients whose heart disease could reasonably be attributed to a deficiency of vitamin B_1, and our impression is that such cases are distinctly uncommon.

In a woman, aged 67, suffering from essential hypertension, with a normal blood urea and electrocardiogram, we found the blood vitamin B_1 was normal: 6.8 μg. per 100 c.cm. A second poorly nourished patient, with hyperpiesis, albuminuria, an enlarged liver, and oedema of the legs, but a normal blood urea, and who had had two previous attacks of eclampsia, had a blood vitamin B_1 of only 5.5 μg. per 100 c.cm.

A man aged 64 with arteriosclerosis and nephritis had a blood pressure of 135/80, albuminuria, a normal blood urea, impaired renal function, anaemia (red blood cells 3,872,000 per c.mm., haemoglobin 62 per cent., colour index 0.8, white blood cells 8,800 per c.mm.), and a blood vitamin B_1 within the normal range—7.4 μg. per 100 c.cm. A young man aged 23 suffering from extreme heart failure of obscure aetiology, whose heart was very much enlarged, was found to have a blood vitamin B_1 of 7.5 μg. per 100 c.cm. After a serious prolonged illness he eventually recovered.

Endocrine Diseases

A few preliminary observations were made on a miscellaneous group of patients with endocrine disturbances, but the numbers are as yet too few to permit deductions to be made. Any changes in vitamin B_1 metabolism are probably secondary to other metabolic disturbances. It has been shown that the need for vitamin B_1 is increased in states of increased metabolism in animals (Cowgill, 1934). Clinical hyperthyroidism, however, is usually associated with increased appetite and the consumption of a well-balanced diet, and only rare instances are accompanied by anorexia. Moreover, the reports of the clinical trial of vitamin B_1 in various metabolic disturbances are conflicting. There is, however, a close relation between vitamin B_1 and carbohydrate metabolism, and changes in the blood vitamin B_1 content in these conditions may be determined by associated disturbances of the carbohydrate metabolism. The following were the observations made:

1. In three of our patients with thyrotoxicosis two had basal metabolic rates of + 80 per cent. and + 68 per cent. respectively; their blood vitamin B_1 values were subnormal, being 5.4 μg. and 5 μg. per 100 c.cm. respectively. The third patient (a woman aged 24) had had five operations on the thyroid gland and still presented the typical symptoms of toxic hyperthyroidism with a basal metabolic rate of + 48 per cent., achlorhydria, and a hypochromic microcytic anaemia; her blood vitamin B_1 was 7.1 μg. per 100 c.cm.

2. A youth aged 19 with eunuchoid infantilism presented the typical appearance of hypogonadism and dwarfism, had a mild hypochromic microcytic anaemia, a basal metabolic rate of − 40 per cent., and a normal glucose tolerance; his blood vitamin B_1 was subnormal, being only 5.4 μg. per 100 c.cm.

3. A woman with very severe Addison's disease who responded dramatically to treatment with large doses of cortin had a blood vitamin B_1 value of 11 μg. per 100 c.cm. at a time when her blood pressure was 65/55.

Vitamin B_1 Tolerance Tests

The possibility of using tolerance tests for determining vitamin B_1 deficiency has been under investigation, and the conclusions will be published separately. The results so far obtained resemble those of Portnoy and Wilkinson (1938) using vitamin C—that is to say, there is a rapid rise in the blood vitamin B_1 level within the first fifteen

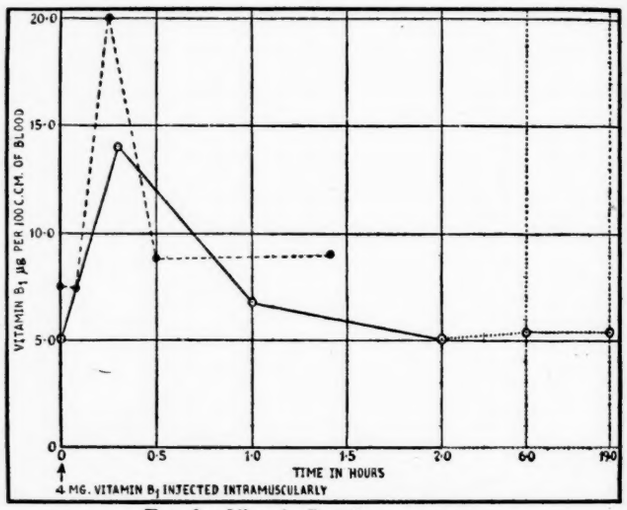


FIG. 3.—Vitamin B_1 tolerance curves.

to twenty minutes after administration of vitamin B_1, followed by a quick fall to normal levels. The pure vitamin B_1 (aneurin) is given by parenteral injection, intramuscularly for preference, and samples of blood are withdrawn at frequent intervals, the vitamin B_1 being estimated by the method described herein. A disadvantage of these tolerance tests is that relatively large samples of blood must be withdrawn by venous puncture at short intervals—every five minutes for the first twenty to thirty minutes, and then half-hourly.

In Fig. 3 are shown specimen normal curves following the intramuscular injection of 4 mg. pure vitamin B_1 (aneurin). It will be seen that the maximum blood vitamin B_1 peak occurs about fifteen to eighteen minutes later, and is followed by a rapid fall to normal levels within an hour.

DISCUSSION

Our investigations seem to show that gross vitamin B_1 deficiency is rare in this country. This is not unexpected, since the daily requirement for the normal individual is about 500 international units (1 mg. pure vitamin B_1): vitamin B_1 has a very wide distribution in foodstuffs, and it is therefore almost impossible for the intake to be inadequate with a reasonable diet. This is in marked contrast to the position with vitamin C, the distribution of which is restricted to certain types of food such as fresh fruits and green vegetables: further, vitamin C is required in much larger daily amounts, and is present in the blood in much greater quantities.

Nevertheless, vitamin B_1 deficiency may arise from (1) an inadequate supply, (2) inadequate absorption,

(3) inadequate utilization, or (4) through its destruction in the alimentary tract.

1. *Inadequate Supply.*—It is known that the storage of vitamin B_1 in the body is limited, and therefore a minimal intake is essential to meet the normal requirements; thus the deficiency observed in patients with alcoholic neuritis, severe malnutrition, and scurvy is undoubtedly due to a defective intake of vitamin B_1, and this is probably also a factor in incipient diabetic coma. Excessive vomiting as in hyperemesis gravidarum may lead to loss from the stomach of vitamin B_1 taken in food and the development of a deficiency; this may be the mechanism by which polyneuritis of pregnancy is produced. A *normal* intake of vitamin B_1 may be inadequate in certain conditions of hypermetabolism such as pregnancy, lactation, and hyperthyroidism, in which increased supplies of vitamin B_1 may be required. Thus the low values in our hyperthyroid patients may be attributed to a failure to meet an increased demand; it is interesting that the patient who gave a normal figure did not show the typical emaciation associated with thyrotoxicosis.

2. *Inadequate Absorption.*—The vitamin B_1 deficiency observed in cases of simple achlorhydric microcytic anaemia may be an impairment of vitamin B_1 absorption, but the part played by the achylia gastrica in this respect is not known, and it may be concerned with some further intermediate chemical mechanism. Many difficulties arise, since in pernicious anaemia and subacute combined degeneration of the cord achlorhydria is almost invariably present, but the blood vitamin B_1 values are normal in the absence of complications, so that there must obviously be other factors of importance.

3. *Inadequate Utilization.*—This is associated with hypometabolism (as shown by some cases of hypochromic anaemia which fail to respond unless thyroid is given with the iron), toxaemias as from chronic nephritis, and infection; the low figure given by the patient with carcinoma of the larynx may come into this category. It is interesting to note that Schopfer and Jung (1937) found less vitamin B_1 in cancerous tissues than in normal tissues. An unbalanced diet, especially an excessive intake of carbohydrate, has long been known to affect the utilization of vitamin B_1.

4. *Destruction of Vitamin B_1.*—The destruction of vitamin B_1 in the alimentary tract could also lead to an insufficient supply of vitamin B_1 being available for absorption, but the conditions under which this might arise are not clear.

It is evident that a vicious circle arises: in many of these deficiencies an inadequate dietetic intake leads to anatomical or physiological changes within the intestine and then to diminished absorption, which in turn leads to further disorder of the intestinal function. Moreover, some balance between the specific nutritional elements, such as iron and vitamin B_1, may be necessary.

THERAPEUTIC VALUE OF VITAMIN B_1

The only conditions in which a gross deficiency of vitamin B_1 was found were: alcoholic neuritis, nutritional neuritis, scurvy, and malnutrition, and in these cases marked improvement followed the administration of vitamin B_1 (and vitamin C in the scorbutic patient). A partial deficiency was observed in simple achlorhydric anaemia.

The cases of subacute combined degeneration of the spinal cord gave normal figures, so the poor therapeutic results following the administration of vitamin B_1 obtained by us and other workers are not surprising. Similarly, in spite of a few sporadic claims for its efficacy, the vitamin has not proved of much value in polyneuritis other than the alcoholic, gestational, and nutritional forms, and this finding corresponds with the values for blood vitamin B_1 found in this series. It appears, therefore, that the changes in the nervous system in these conditions, though clinically similar to those reported in beriberi, are of different aetiology and not associated with vitamin B_1 deficiency. There is no clinical evidence that vitamin B_1 is concerned in haemopoiesis, and this is corroborated by the normal figures given by this test in the uncomplicated primary anaemias.

Summary

1. The Schopfer phycomyces test has been applied to the estimation of vitamin B_1 in the blood.

2. The modified method described can be adapted as a reasonable test for vitamin B_1 nutrition, and appears to be the best method at present available for dealing with the small quantities of vitamin B_1 in the blood, but it is too laborious and exacting in technique to serve as an ordinary routine laboratory method.

3. The range for the vitamin B_1 content of blood in eight normal subjects was 6.5 to 16.5 μg. per 100 c.cm.

4. From our experiments vitamin B_1 was found to be present in normal amounts in the blood of patients with subacute combined degeneration of the spinal cord, polyneuritis (excluding that due to alcohol and malnutrition), pernicious anaemia without neurological involvement before and after treatment, and secondary microcytic anaemia.

5. Gross deficiencies were present in alcoholic neuritis (4 μg. per 100 c.cm.), nutritional neuritis (3.5 and 4.5 μg. per 100 c.cm.), scurvy (4.8 and 5.5 μg. per 100 c.cm.), and malnutrition (4.7 μg. per 100 c.cm.); partial deficiencies were noted in simple achlorhydric anaemia (5.3 μg. to 6 μg. per 100 c.cm.).

We wish to thank those members of the honorary medical staff of the Manchester Royal Infirmary who kindly allowed us to examine patients in their hospital and private practices, and also Messrs. Roche Products Ltd. for kindly supplying the synthetic vitamin B_1 (aneurin) used in this work.

REFERENCES

Alsted, G., and Lunn, V. (1938). *Acta med. scand.*, **94**, 601.
Cowgill, G. R. (1934). *The Vitamin B Requirement of Man*. Yale University Press, New Haven; H. Milford, Oxford University Press, London.
Davidson, S. (1931). *Lancet*, **2**, 1395.
Davison, C., and Stone, L. (1937). *Arch. Pathol.*, **23**, 207.
Elsom, K. O. (1937). *J. clin. Invest.*, **16**, 463.
Fouts, P. J., Kempf, G. F., Greene, J. A., and Zerfas, L. G. (1932). *J. Indiana med. Ass.*, **25**, 448.
Goodhart, R., and Jolliffe, N. (1938). *J. Amer. med. Ass.*, **110**, 414.
Harris, L. J., and Leong, P. C. (1936). *Lancet*, **1**, 886.
Hutchison, R., and Mottram, V. H. (1936). *Food and the Principles of Dietetics*. Arnold, London.
Jolliffe, N., and Colbert, C. N. (1936). *J. Amer. med. Ass.*, **107**, 642.
——— and Joffe, P. M. (1936). *Amer. J. med. Sci.*, **191**, 515.
McCarrison, Sir R. (1936). Cantor Lectures: Nutrition and National Health, p. 31.
Meiklejohn, A. P. (1937). *Biochem. J.*, **31**, 1441.
Minot, G. R., Strauss, M. B., and Cobb, S. (1933). *New Engl. J. Med.*, **208**, 1244.
Portnoy, B., and Wilkinson, J. F. (1938). *British Medical Journal*, **1**, 554.
Roscoe, M. H. (1936). *Biochem. J.*, **30**, 1053.
Russell, W. R. (1936). *Edinb. med. J.*, **43**, 315.
Schopfer, W. H. (1935). *Z. VitaminForsch.*, **4**, 67.
——— and Jung, A. (1937). Ve Congrès Int. Tech. et Chim. des Indust. Agric., Scheveningue.
Sciclounoff, F., and Broccard, R. (1936). *Schweiz. med. Wschr.*, **66**, 985.
Vorhaus, M. G. (1937). *Amer. J. digest. Dis. Nutrit.*, **3**, 915.
Weiss, S., and Wilkins, R. W. (1936). *Trans. Ass. Amer. Phys.*, **51**, 341.
Williams, R. R. (1938). *Ergebn. Vitamin und HormonForsch.*, **1**, 214.
Wills, L. (1931). *British Medical Journal*, **1**, 1059.

TREATMENT OF BRUCELLA ABORTUS INFECTION WITH FOUADIN AND PRONTOSIL

BY

A. P. THOMSON, M.D., F.R.C.P.

Honorary Physician to the General Hospital, Birmingham

Reports on the treatment of *Brucella abortus* infection with fouadin and prontosil are gradually accumulating. Personal experience during the last year with the five cases here recorded supports the general impression that in the treatment of this disease both prontosil album and fouadin are of value, and that the former may prove to be a simple specific remedy when the patient can tolerate it in moderate doses (about 3 grammes daily) for a week. In view of the tendency to relapse (Case III) it is probably wise to give short intermittent courses of the drug for two or three months after the fever has disappeared.

Case I

A man aged 37, a patient of Dr. W. C. Blackham of Moseley, was admitted to the General Hospital, Birmingham, on August 3, 1937. In January, 1929, he had pneumonia after influenza. Bilateral sterile pleural effusions followed; that on the left side recurred so often that an exploratory thoracotomy was done without effect. In September, 1929, a large abscess emptied itself through the operation wound; its origin was never determined, but it was thought to have tracked from the mediastinum. The sinus did not heal until 1931. He remained well and active until three weeks before admission, when he became febrile (temperature usually about 100° F. at night) and had transient slight pain in the right hypochondrium. Fever persisted at about the same level; there was some sweating at night, and the pulse varied between 72 and 80.

Physical examination was negative apart from flattening of the left chest—a consequence of the illness in 1929. The urine was normal. A radiograph of the chest showed nothing of significance; a cholecystogram was normal. There was slight leucopenia (polymorphs 50 per cent. in a count of 5,000). Agglutinations on August 5 were positive to *Br. melitensis* at 1 in 250, 1 in 500, and 1 in 1,250, but not at 1 in 50 or 1 in 2,500; to *Br. abortus* at 1 in 250 and (feebly) 1 in 500; and negative for the typhoid and Salmonella groups.

A week later without treatment his condition was unchanged, but the agglutination to *Br. melitensis* now occurred at 1 in 2,500 and to *Br. abortus* at 1 in 1,000. On August 13 he was given 1.5 c.cm. fouadin, and the evening temperature fell to 99° F.; on the 16th 3.5 c.cm. of fouadin was given, and his temperature fell to normal. Three further injections of fouadin, each of 5 c.cm., were given at weekly intervals. After both the last two injections he had a rigor and his fever rose to 102° for a few hours; otherwise, apart from a trivial sore throat, his convalescence was uneventful. On September 7 agglutinations to *Br. abortus* and *Br. melitensis* were obtained at 1 in 5,000 dilution.

Case II

For the following notes I am indebted to Dr. M. I. Dick of Alvechurch. I did not see the patient myself, but advised treatment on the telephone.

The patient was a farmer's wife aged 45, and was the only member of the household who drank no milk except in her tea. She felt ill all through January. She was first seen on January 31, when she complained of aching all over. No abnormal physical signs were observed. Temperature 102° F.

During the following week her condition was unchanged, her temperature being round 101° F. in the morning and 103° F. in the evening. On February 7 strong positive agglutination to *Br. abortus* was obtained. The same day the patient began to take one tablet of prontosil every four hours. Three days later she complained that the tablets made her sick, and as her condition was no better they were stopped, and on the 12th fouadin was given, the first injection being 3.5 c.cm., and every other day afterwards 5 c.cm. On February 14 her temperature began to come down, and by the 18th was considerably lower. By February 26 she was much better, the morning temperature being normal and the evening temperature usually about 100°. The last injection was given on February 26, nine having been administered. On March 8 the patient was up for a few minutes, but was still having a slight evening rise and was feeling very weak. On March 25 she came downstairs.

Case III

A woman aged 61, a patient of Dr. C. Lowe of King's Heath, was admitted to the General Hospital, Birmingham, on May 24, 1938. She had been treated for pulmonary tuberculosis in 1918, but there was no subsequent ill-health. She had three children, one of whom had tuberculosis of the hip. For six weeks before admission she had high fever (between 102° and 103° F.), usually from midday until 10 p.m., when she sweated profusely. Shivering attacks occurred at intervals. Her appetite was poor; she lost weight and was unable to sleep. She also complained of a tongue that had been "sore and swollen."

Physical examination was negative. The pulse was 110. The urine contained a few pus cells, hyaline casts, and streptococci. Radiographs of the chest were normal. The blood count showed a slight simple anaemia and leucopenia (polymorphs 46 per cent. in a total count of 3,800). Agglutinations were positive to *Br. abortus* at all dilutions to 1 in 2,500 and to *Br. melitensis* to 1 in 1,250; negative to the typhoid and Salmonella groups.

From May 28 to June 5 she was given 3 grammes of prontosil album daily; from June 6 to 10 she had 1 gramme daily. The temperature fell to normal on June 2, and remained so (six days after the first dose of prontosil). In hospital the highest fever recorded was 101° on the day before treatment began. On June 15 agglutination to *Br. abortus* could only be obtained up to 1,250; at this date the leucopenia persisted (3,900) at the same level as before treatment.

The patient left hospital apparently well on June 18. A fortnight later she had a recurrence of symptomless fever, which disappeared after a few days' treatment at home with prontosil album under the care of Dr. Lowe. There has been no relapse since.

Case IV

A woman aged 62, a patient of Dr. Jessiman of Malvern. She had had typhoid in her youth, and her gall-bladder had been drained in 1920. She had been subject to migraine all her life. Rheumatic pains occurred in the right shoulder and sacro-iliac joints for a year, and she "had not been quite well" for some months.

History of Present Illness.—She has been feverish for five weeks (temperature at first between 100° and 101° F. at night and about normal in the morning, but during the last five days has been continuously between 101° and 102° F.). There have been profuse night sweats with an unpleasant odour and occasional "shivers," some neuralgic pain in the face and indefinite pains about the body, a little cough but no sputum, but no other symptoms apart from a sense of severe illness. A radiograph of the chest was normal, and the urine was sterile and otherwise normal. A blood count showed a leucopenia (polymorphs 60 per cent. of total count of 3,600). Blood culture proved sterile: the Widal test proved negative to the typhoid group; and the Mantoux test was also negative. A little dullness was found at the right base; subphrenic abscess was considered, but exploration proved negative (Dr. Jessiman).

The patient was first seen on May 24, 1938, on admission to a nursing home, being very collapsed after an ambulance journey of forty miles, and having a sense of impending death. Physical examination proved negative. On the evening of

May 25 her temperature was 103° F. and pulse 106. On May 26 agglutination to *Br. abortus* was positive in dilutions of 1 in 250 to 1 in 1,000 (Dr. J. H. Ebbs). Prontosil album (1 gramme daily) was given on May 26 and 27. Subsequently the dose was increased to 1.3 grammes daily until May 31, from which date 1 gramme daily was given to June 6. The temperature reached 103° F. during the first three days of treatment, but then fell rapidly to normal in the next three days; convalescence was rapid and apparently complete. On June 10 (after ten days of normal temperature) agglutination to *Br. abortus* occurred only in dilutions of 1 in 25 and 1 in 50. The blood count on that date was: haemoglobin, 78 per cent.; erythrocytes, 4,500,000 per c.mm.; leucocytes, 6,400 per c.mm. (polymorphs 42 per cent. with slight toxic granularity) (Dr. J. H. Ebbs).

The patient went to Yorkshire for a holiday on June 19. Towards the end of the month she developed symptoms of cystitis with a high temperature (103° F.). Dr. J. MacGowan of Shipley saw her in consultation and kindly wrote to me on July 8: "Clinically her illness has been solely due to the cystitis, and had she not given a history of having had undulant fever this would never have entered my head. The cystitis has reacted well to sodium mandelate, and she has been afebrile for about a week." In a specimen of blood taken by Dr. MacGowan during the acute stage of the cystitis agglutination to *Br. abortus* up to 1 in 2,560 and to *Br. melitensis* to 1 in 320 was found by Dr. J. C. Young of Bradford and also by Dr. J. H. Ebbs of Birmingham. The patient has been well since.

Case V

A woman of 50, a patient of Dr. H. V. Jessop of Burton-on-Trent, was first seen on June 22, 1938. She had led an active vigorous life with no illness of significance until six weeks previously. She then felt vaguely unwell and sweated profusely at night, the sweats having a sour, unpleasant smell. Despite this she went for a holiday to the seaside. On her return her temperature was taken for the first time and was found to be 102° F. The fever persisted and was often highest in the mornings. Physical examination was completely negative. The pulse was relatively slow (88 to 96), and the urine was normal. Agglutinations were positive to *Br. abortus* from 1 in 25 to 1 in 900 (Dr. J. H. Ebbs); negative to typhoid and Salmonella groups.

Two grammes of prontosil album were given daily from June 22 to July 2; then for three days 2½ grammes daily. From July 5 she took 1½ grammes daily until the 9th, when the drug was discontinued. During the first five days of this treatment there was high continuous fever (from 100 to 103° F.), with severe headache and pains in the limbs. On June 27 physical examination was still negative. On the 28th the temperature fell to normal, and subsequently was raised at times to about 99° F. until July 6, when the fever ended. Her general condition rapidly improved, convalescence being uneventful. A blood count on June 27, after 10 grammes of prontosil, showed no leucopenia (polymorphs 63 per cent. in a total count of 9,900).

In view of the relapse in Case III I advised that prontosil (1½ grammes daily) should be taken during one week of each of the two following months.

Summary

Five cases of infection with *Br. abortus* are reported. One was treated with fouadin alone with apparent benefit (Case I). It was a mild case, but fever had been continuous for four weeks, and the titre of the specific agglutination rose steadily in the week before treatment began.

Case II took prontosil album (3 grammes daily) for three days without improvement, and as she then began to vomit treatment by fouadin was adopted. Dr. Dick considers that she undoubtedly benefited, and her fever declined considerably in five days, though it did not become normal for a fortnight.

Cases III, IV, and V were treated with prontosil alone, and in all of them improvement was rapid and in the most severe one (Case IV) was dramatic. The temperature fell to normal in all of them in less than a week. In view of the tendency to leucopenia in *Br. abortus* infection the dose of prontosil album used was comparatively small; in none of the cases were any toxic symptoms observed, and there was no increase in the leucopenia found in two of them.

Case III had a relapse three weeks after prontosil was discontinued, but it was rapidly controlled by a further course of the drug.

Case IV had acute cystitis during convalescence; this cleared up under treatment with sodium mandelate.

In Cases II and IV the specific agglutinations declined to negligible titres after prontosil treatment; this was not observed in Case I, which was treated with fouadin alone.

In Case IV the specific agglutination rose again to a high titre during the febrile reaction to the cystitis. Topley and Wilson state: "Agglutinins are generally present in a suggestive titre by the end of the second week, and in frank cases of undulant fever they generally rise to 1 in 640 or over. After the attack is over they tend to fall fairly rapidly, and may sink to a low level within three months. There is evidence that in chronic cases they may fall even during the period of active infection."

It would be interesting to know if a fall in the agglutination titre is common after prontosil treatment.

[Since this article was written Case V had a slight relapse early in September. Fever persisted only three days and was rapidly controlled by prontosil.]

REPORT ON FIVE CASES OF BRUCELLA ABORTUS INFECTION

BY

MICHAEL GAFFNEY, M.B., F.R.C.S.

Honorary Surgeon, Lloyd Hospital, Bridlington

Infection by *Brucella abortus* is uncommon enough in this country to justify the recording of the occurrence and treatment of five cases in one practice.

History of the Disease and its Mode of Spread

Brucella abortus was first identified by Bang in 1897, and it was shown by him to be the cause of contagious abortion in cattle. It was then called "Bang's bacillus." Kennedy in 1914 demonstrated agglutinins for *Brucella melitensis* in milk and serum of cows in London—which cows were no doubt infected by *Br. abortus*. But it was not until 1921 that Bevan, in Rhodesia, demonstrated agglutinins in human serum. Cases were first reported in England in 1928–9.

It is stated by experienced workers that the usual mode of spread of the disease is by infected unpasteurized milk and cream, but it can also be spread by contact with infected animals, their carcasses, discharges, or excreta. It appears that a healthy cow may continue to yield milk which is infected long after all symptoms of abortus fever have cleared up. The disease may also be disseminated by farm hands, butchers, sausage-makers, and veterinary surgeons: the latter's serum often contains agglutinins, though activity of the disease has never been manifest. Infection in such cases is probably latent. Contact from man to man has never been demonstrated (Beckman, 1938).

Account of the Present Series

Symptoms.—In all five cases the onset was insidious. The patients complained of malaise, sweating, bouts of shivering, loss of energy, loss of appetite, and a feeling of lassitude and of being out of sorts, but none of them could fix a definite date for the onset. They mostly said that for several days, and in some cases weeks, they felt off-colour. Headache and pains in back and joints were fairly constant features.

Clinical Features.—What struck me most was that although these patients had very high temperatures—102° to 104° F.—the pulse rate was relatively slow and they neither felt nor looked desperately ill. None of them showed any signs of anaemia, and in one case which relapsed and in which anaemia was suspected the blood count was normal. In two cases there were patches of dullness in the chest which were of a shifting nature. Tenderness over the gall-bladder was common in all cases, though not very pronounced. There was no anorexia, no enlargement of the spleen or of the liver that I could detect, and no diarrhoea; but there was a tendency towards constipation, probably due to loss of fluid from the body owing to sweating. The temperature was usually highest at about 6 to 7 p.m. (102° to 103°) and normal in the morning. Depression was fairly general, and one patient who recovered rather quickly was very depressed for several weeks afterwards. The depression may have been partly due to the sulphanilamide.

Diagnosis.—The clinical features of the disease are so vague and indefinite that diagnosis is extremely difficult. The long-continued fever without any other definite signs may make one suspicious and may lead to a tentative diagnosis; but the malady may be confused with other conditions—for example, tuberculosis, influenza, bronchial pneumonia, or typhoid, as well as tularaemia, infective arthritis, and Hodgkin's disease; hence one has to seek the aid of the laboratory. In fact, it is only by laboratory examination for agglutinins that the definite diagnosis of the disease can be arrived at. It appears that the organism can also be cultivated from blood, faeces, and urine; but this is successful in a small number of cases only. Blood cultures were tried twice in one of my cases without success. This failure is not to be wondered at, since Sir Weldon Dalrymple-Champneys shows only 16 per cent. of successes in his records. In all my cases the blood serum was positive in dilutions of from 1 in 500 to 1 in 2,500.

Treatment.—All the cases were treated with sulphanilamide, starting on the first day with 22½ grains. On the second day 45 grains were given, this daily dose being kept up until the temperature was normal morning and evening. The dose was then decreased for three days, when it was stopped. In four cases the temperature fell to normal in from seven to ten days; but in one case it rose each evening to 100° for fourteen days, and then kept on gradually coming down for another thirteen days before it remained normal. The sulphanilamide was continued throughout that period. The temperature has remained normal since, and this patient has not had a relapse.

Relapses.—Three cases relapsed. Two relapses took place after the temperature had been normal for about fourteen days and one at twenty-eight days. The clinical features were much the same as in the earlier stages, but the patients felt less ill. Sulphanilamide was again given, and after varying periods (three to six days) the temperature settled down once more and has remained normal since.

Complications from Sulphanilamide.—There was only one patient—a woman aged 39—who showed any idiosyncrasy to it. She received 45 grains daily, becoming cyanosed and showing definite congestive symptoms, with marked tachycardia. In her case the drug was discontinued for two days, and she was then given 22½ grains daily. This was the patient who relapsed after her temperature had been normal for twenty-eight days. Other patients complained about being depressed. Their depression was considerably less when the drug was stopped.

Commentary on the Cases

Five cases of *Br. abortus* infection were treated with sulphanilamide, and it is my opinion that the drug had a definite influence in decreasing the length of the disease, the duration of which is said by Sir Weldon Dalrymple-Champneys to vary from three to thirty-nine weeks, with an average of twelve and a half weeks, though I suppose that five cases are too small a number for much reliance to be placed on the success of the drug. The longest period in any case of mine in which the fever persisted continually was four weeks, the shortest two weeks. In the three relapses, when sulphanilamide was repeated the temperature dropped to normal in from three to six days and has remained normal since. The last of these relapses occurred forty-one days ago. It is said by Gatt (1938) that American workers have not found the drug to have had any influence on the course of the disease, but other practitioners (Lloyd, 1938; Matthews, 1938) believe that the drug does shorten the course of the disease. Moreover, the fact that the temperature settled down in a few days in all three cases of mine that relapsed and were given the drug again is fairly good proof of its efficacy.

Their Mode of Spread

In all five cases that came under my notice the milk was obtained from the same dairy. There was also one other case in another doctor's practice; the milk concerned in this came from the same dairy and at about the same time. The first case occurred in my practice on January 14, 1938, the last was detected on May 5. The fact that six cases were seen in a period of less than four months and that all of these patients obtained their milk from the same dairy may indicate either a fairly heavy infection of the herd or a virulent organism. The dairy in question is one of the best in England, and supplies only T.T. milk. The owner denied that any of his herd were suffering from contagious abortion at the time the first case was discovered, but admitted that he had a cow that aborted in December, 1937. He had her removed from the herd shortly afterwards, and since then no cow had aborted or shown any signs of abortion. The milk from the herd was examined in batches by the North Riding Laboratory, Scarborough, but no growth of the organism was obtained. In view of what has already been said, this is not to be wondered at. Since the outbreak the herd, which is composed of fifty-five cows, all tuberculin-tested, has been inspected by a veterinary surgeon from the Board of Agriculture and Fisheries, and all were found to be healthy and free from any disease of the udder. The question of a human carrier might arise. Needless to say the outbreak caused great alarm to the dairy farmer concerned, as he supplies about 800 bottles of T.T. milk daily to this area, and, moreover, he is one of the chief pioneers of clean milk in the country.

General Commentary

Hitherto only isolated cases have been reported by different practitioners up and down the country; conse-

quently five cases in one practitioner's practice must be considered most unusual. The age incidence is more or less in conformity with other people's findings. The sex incidence, however, is well worth noting: I had two males and three females, and another practitioner had one female—that is, four females and two males. Creed states that the relation is two males to one female—mine is the reverse. He also says that the reason why so many males are infected is that they only drink milk spasmodically and not often enough to keep up their immunity. Perhaps it is the females who don't drink milk sufficiently nowadays, in case they lose their figures! There is also one other point: a husband and wife were found to be suffering from the disease. It appears, from what Sir Weldon Dalrymple-Champneys says, that this is the first married couple that has been reported suffering from the disease. They were both ill at the same time. It is said that abortus fever is not transmitted from man to man. Here it may have been. It appears that one attack confers lasting immunity on the individual, and it may be possible that many people become immunized by repeated small doses of infected milk and yet never develop any definite signs of the disease.

I understand that there is a movement afoot by the Board of Agriculture and Fisheries to try to stamp out the disease.

Pasteurization of milk is the only safeguard against abortus fever. This must be done with a proper plant, as *home* pasteurization, which has been tried by one family, has not been a success, since each member complained that the milk was unpalatable.

I beg to thank Sir Weldon Dalrymple-Champneys for his great kindness and for many helpful suggestions in preparing these notes, and also Dr. Colville, medical officer of health for Bridlington, for reports on the herd and the milk.

BIBLIOGRAPHY

Beckman, H. (1938). *Treatment in General Practice*. Saunders, Philadelphia.
Creed, E. F. F. Abortus Fever. *British Encyclopaedia of Medical Practice*, 1, 68, London.
Dalrymple-Champneys, Sir Weldon (1929). Report on Undulant Fever, Ministry of Health Special Report No. 56, London.
Gatt, J. E. H. (1938). *British Medical Journal*, 1, 454.
Lloyd, J. H. (1938). Ibid., 1, 145.
Matthews, N. (1938). Ibid., 1, 483

G. Frontali and G. Ferrari (*Minerva med.*, 1938, **29**, 133) record their observations on fourteen cases of pellagra, five in men and nine in women. Seven had had from one to six previous attacks, and in seven it was the first attack. All had severe attacks with nervous symptoms, and in ten cases psychical symptoms were also present. Three cases were chronic forms with symptoms of dementia, and belonged to families in which other members had had psychoses associated with pellagra. Seven cases showed forms of amentia with depressive manifestations, and two of these were also chronic alcoholics with delirious ideas and visual and auditory hallucinations. All the patients were treated for periods ranging from thirty days (nine cases) to forty or fifty days (five cases) with nicotinic acid in doses of 160 mg., partly by mouth and partly by intramuscular injection. In four cases the treatment was associated with a diet likely to produce pellagra. The results were the same in all cases. There was: (1) complete cure of the pellagrous dermatitis in one or two weeks; (2) resumption of the normal digestive functions and a gain of 5 to 8 kg. in thirty to thirty-two days; and (3) a slow but sure disappearance of nervous symptoms in three or four weeks' time. As regards the psychical manifestations, the three chronic cases with dementia showed no appreciable change, while the others made a complete recovery.

THE SUPPRESSION OF LACTATION BY ORAL OESTROGEN THERAPY

BY

G. L. FOSS, M.A., M.B., B.Ch.

Colston Research Fellow, 1935-7; Clinical Assistant in the Gynaecological Out-patient Department, Bristol Royal Infirmary

AND

P. PHILLIPS, M.Sc., M.D., Ch.B.

Medical Superintendent, Southmead Municipal Hospital, Bristol

Recent progress in the study of lactation has assigned to the anterior pituitary gland the initiation of yet another physiological process—namely, lactation. A large body of workers have demonstrated that injections of anterior-lobe extracts stimulate lactation in the mammary glands of guinea-pigs, rabbits, ferrets, goats, cats, dogs, sows, cows, and monkeys where previously they have been adequately treated with oestrogens. The literature is very well reviewed by Folley (1938).

It is common knowledge that lactation in the human does not begin until forty-eight to seventy hours after the birth of the child, and is preceded by a gradual engorgement and distension of the breasts, which are stimulated by the mechanical action of suckling; this causes release of the lactogenic hormone from the anterior pituitary (Selye, Collip, and Thomson, 1934). In view of the interrelation and antagonism of the various hormones in the body it is thought that the development of the breasts occurs under the influence of oestrogen and progesterone during gestation. Oestrogen causes growth of the duct system, while progesterone and oestrogen develop the lobule-alveolar system (Nelson, 1936). At parturition, and following the separation of the placenta, the oestrogen-progesterone level falls and the inhibition of the anterior pituitary is removed, with the result that the release of lactogenic hormone stimulates milk formation in the mammary glands (Nelson, 1936).

Clinically this knowledge is of considerable importance from two main aspects: (1) stimulation of lactation; (2) suppression of lactation.

Stimulation of Lactation

This depends upon treatment of cases showing a deficiency of milk secretion with the anterior pituitary lactogenic hormone called "prolactin" by Riddle. So far experiments have almost exclusively been carried out on animals, but Folley (1938) suggests that the extracts used must have contained other pituitary factors. Kurzrok, Bates, Riddle, and Miller (1934) and Ross (1938) claim that there is a slight increase of secretion in women after administration of large doses of prolactin, and that the mothers treated were able to nurse their infants completely on discharge from hospital, whilst the untreated controls had to use artificial feeds. The impurity of the extracts at present available is probably responsible for severe local reactions which follow the injections of the larger doses, and, so far, the stimulation of lactation is of scientific interest only.

Suppression of Milk Secretion

This is a definite clinical application of great importance, but unfortunately it is as yet very little known. Once lactation is established, Folley (1936) has shown, in

the cow, that oestradiol monobenzoate and oestrone concentrate the fatty and non-fatty solid content of the milk. It is suggested that the administration of exogenous oestrin will inhibit the anterior pituitary also and depress the lactogenic principle. Various reports have appeared on this inhibitory action by injections of the follicular hormone in lactating rats (Folley and Kon, 1938; Herold, 1938) and women (Lindemann, 1938; Brea and Gándara, 1937; Adrian, 1938), mostly using quite large doses by the intramuscular route.

It is our object to show that small doses by mouth are perfectly adequate and that a definite advance can be claimed for such simple therapy. Our attention was called particularly to the action of oestradiol benzoate injections in suppressing lactation following attempts to induce labour and for sensitization of the uterus when the foetus was believed to be dead. It was found that after delivery the breasts were devoid of all secretion of milk.

Case A.—Mrs. H., aged 30, 1-para, was admitted at full term on October 7, 1937. Medical induction at 5 p.m. on October 7 and surgical induction on October 11 failed to start pains. Oestradiol benzoate (progynon) 5 mg. was injected intramuscularly as follows: On October 14 at 7 and 9 p.m.: on October 20 at 12 noon and 4 p.m.; on October 30 at 12 noon, 4 p.m., and 8 p.m. Labour commenced at 12 noon on November 1 of its own accord, and a normal male infant was born at 6.55 p.m. the same day, weighing 6 lb. 13 oz. As a result of this treatment with oestradiol benzoate the breast secretion was absent and the child was put on artificial feeds.

Case B.—Mrs. T., aged 29, 1-para; due May 5, 1937. No movements were felt on March 9, and it was thought that the uterus was becoming smaller. The patient was admitted on March 10, and oestradiol benzoate (progynon) 5 mg. was given the same day. Medical induction was tried on March 11. On March 13, 5 mg. of progynon was given at 2, 3, 4, and 5 p.m. A macerated foetus was expelled at 2 p.m. on the 14th with the cord around the neck five times. Breast secretion was absent.

A case of lactorrhoea was treated in September, 1936:

Case C.—Mrs. R., aged 38, had had three children, the youngest of whom was 2½ years old. She came to hospital on September 23 thinking she was pregnant, as her breasts had swollen and were leaking milk. Her periods had been regular from a month after the last baby, which she fed for four to five months. On June 27, 1936, she had noticed that her breasts had become full of milk, and this condition had persisted since. A sample was expressed for analysis, and was found to be normal human milk. Oestradiol benzoate in doses varying from 5 mg. once weekly to 15 mg. twice a week for periods up to a month effected a temporary suppression only. It was found also that small doses of oestrone (1,000 I.U.) given by mouth frequently had the same temporary effect.

Tage Kemp and Pedersen-Bjergaard (1937), in a paper on absorption and excretion of oestrone, state that "the hormone that is administered orally is rapidly absorbed, and is found for a short time in a fairly highly concentrated form in the blood," but it is also very rapidly excreted. "Nevertheless, since oral administration has many practical advantages it will often be preferred. The hormone must, then, be given divided into as many doses as possible during the course of the day, and so far as is possible in a form that will be absorbed slowly." Accordingly a few cases received oral therapy, using progynon dragees, which contain oestrone and also equilin, equilinin, and naturally occurring lipoids. The number of patients available in private practice was small; consequently a series of cases were collected at

Table showing Case Details

Case	Age	Para	Birth	Indication	Treatment and Results
1	33	2	22/6/38	Macerated foetus; prolapsed cord	Tab. ii, 2-hourly for 12 hours then 4-hourly for 3 days. Breast secretion nil
2	20	1	1/5/38	Stillbirth, 36 weeks	2/5/38. Tab. v, b.d. 6/5/38. Breasts normal
3	41	2	23/3/38	Stillbirth ..	28/3/38. Tab. v, b.d. Breasts full 29/3/38. Still full, not painful 30/3/38. Breasts comfortable
4	32	1	8/6/38	Stillbirth, full term	11/6/38. Tab. v, b.d. 13/6/38. Breasts normal
5	18	1	14/5/38	Stillbirth, full term	15/5/38. Tab. v, b.d. 16/5/38. ,, ,, Comfortable
6	40	7	31/3/38	Stillbirth, overdue	31/3/38. Tab. v, b.d. 4/4/38. Breasts normal
7	20	1	27/3/38	Stillbirth, full term	31/3/38. Tab. v, b.d. 1/4/38. Breasts normal
8	26	1	27/3/38	Stillbirth, 42 weeks	28/3/38. Tab. v, b.d. 29/3/38. ,, ,, 1/4/38. ,, ,, Breasts still active 2/4/38. Breasts normal
9	39	1	13/3/38	Stillbirth, 42 weeks	17/3/38. Tab. v, b.d. 19/3/38. Breasts comfortable
10	33	6	1/8/38	A.P.H. and 36 weeks' macerated foetus	2/8/38. Tab. ii, 2-hourly; 5 doses 3/8/38. Breasts fair. Tab. ii, 2-hourly 4/8/38. Breasts normal
11	36	2	16/4/38	Stillbirth, full term	16/4/38. Tab. v, b.d. 17/4/38. ,, ,, 19/4/38. Breasts normal
12	28	2	19/4/38	Stillbirth, full term	19/4/38. Tab. v, b.d. 23/4/38. Breasts comfortable
13	32	2	7/8/38	Stillbirth, 32 weeks	8/8/38. Tab. ii, 2-hourly; 5 doses 9/8/38. Tab. ii, 2-hourly 12/8/38. Breasts soft and comfortable
14	25	1	20/1/38	Stillbirth, full term	24/1/38. Tab. v, at night 25/1/38. ,, ,, 26/1/38. Breasts normal
15	24	1	13/8/38	Stillbirth, 35 weeks	14/8/38. Tab. ii, 2-hourly; 5 doses 15/8/38. Tab. ii, 2-hourly 18/8/38. Breasts still full. Tab. v. 19/8/38. Tab. v and fluid restriction 21/8/38. Breasts normal
16	25	1	14/8/38	Anencephalic	15/8/38. Tab. v, b.d. 19/8/38. Breasts normal
17	33	1	19/5/38	Stillbirth, full term	23/5/38. Tab. v, b.d. Breasts heavy 25/5/38. Breasts normal
18	21	1	2/8/38	Anencephalic	7/8/38. Tab. ii, 2-hourly; 5 doses 8/8/38. ,, ,, ,, 11/8/38. Breasts normal
19	26	1	10/3/38	Stillbirth, 7 months	11/3/38. Tab. ii, 2-hourly; 5 doses 12/3/38. ,, ,, ,, 15/3/38. Breasts normal
20	40	5	5/5/38	Stillbirth, full term	7/5/38. Tab. v 8/5/38. ,, 9/5/38. ,, 10/5/38. Breasts normal
21	39	1	8/7/38	Stillbirth ..	11/7/38. Tab. v 13/7/38. Breasts normal
22	25	3	21/4/38	Stillbirth, full term	22/4/38. Tab. v, b.d. 25/4/38. Breasts soft. 26/4/38. Breasts full. Tab. v, b.d. 29/4/38. Breasts normal
23	25	1	1/8/38	Stillbirth, full term	2/8/38. Tab. v, b.d. 5/8/38. Breasts normal
24	24	1	13/1/38	Stillbirth, 37 weeks	17/1/38. Tab. v, b.d. 24/1/38. Breasts normal
25	28	2	21/6/38	Stillbirth, full term	24/6/38. Tab. v, b.d. 26/6/38. Breasts normal
26	28	2	25/7/38	Stillbirth, full term	26/7/38. Breasts painful. Tab. v, b.d. 27/7/38. Tab. v, b.d. 28/7/38. Breasts comfortable

Table showing Case Details (continued)

Case	Age	Para	Birth	Indication	Treatment and Results
27	27	1	9/6/38	Stillbirth, post-mature	11/6/38. Tab. v, b.d. 13/6/38. Breasts normal
28	29	1	28/7/38	Stillbirth, full term	29/7/38. Tab. v, b.d. 31/7/38. Breasts normal
29	32	1	12/6/38	Stillbirth, post-mature	13/6/38. Tab. v, b.d. 14/6/38. ,, ,, 17/6/38. Breasts heavy 19/6/38. Breasts comfortable
30	27	1	4/1/38	Stillbirth, post-mature	7/1/38. Tab. v, b.d. 8/1/38. Breasts engorged. Tab. v, b.d. 9/1/38. Breasts comfortable
31	25	1	22/3/38	Stillbirth ..	22/3/38. Tab. v, b.d. 25/3/38. Breasts normal
32	29	1	7/8/38	Death of child: haemorrhagic disease	12/8/38. Tab. v, b.d. 14/8/38. Breasts normal
33	20	1	12/8/38	Death of child	18/8/38. Tab. ii, 2-hourly; 5 doses 19/8/38. A little milk 20/8/38. Breasts normal
34	30	2	23/4/38	Child died at 7 days	2/5/38. Tab. v, b.d. 5/5/38. Breasts normal
35	21	1	1/8/38	Child died: spina bifida	4/8/38. Tab. v, b.d. 7/8/38. Breasts normal
36	27	3	27/3/28	Child died ..	31/3/38. Tab. v, b.d. 3/4/38. Breasts normal
37	30	7	21/1/38	Child died 7th day	29/1/38. Tab. v, b.d. 30/1/38. Breasts heavy. Tab. v, b.d. 1/2/38. Breasts comfortable
38	32	1	22/6/38	Child died 2/7/38	3/7/38. Tab. v, b.d. 4/7/38. ,, ,, 5/7/38. ,, ,, 7/7/38. Breasts normal
39	25	1	14/1/38	Child died 15/1/38	17/1/38. Breasts engorged. Tab. v, b.d. 18/1/38. Breasts normal
40	40	4	25/1/38	Twins died ..	29/1/38. Tab. v 30/1/38. Breasts heavy. Tab. v 31/1/38. Breasts normal
41	38	2	18/3/38	Died: spina bifida	30/3/38. Tab. v, b.d. Breasts exhausted 1/4/38. Breasts full. Tab. v, b.d. 3/4/38. Breasts normal
42	37	1	12/7/38	Child died 13/7/38	15/7/38. Breasts painful, emptied. Tab. v, b.d. 16/7/38. Breasts full. Tab. v, b.d. 18/7/38. Breasts comfortable
43	24	1	12/4/38	Tuberculosis of mother	12/4/38. Tab. v, b.d. 13/4/38. Breasts normal
44	26	2	13/8/38	Tuberculosis of mother	15/8/38. Breasts full. Tab. v, b.d. 17/8/38. Breasts painful 18/8/38. Tab. v, b.d. 19/8/38. Breasts normal
45	24	1	22/6/38	Tuberculosis of mother	24/6/38. Tab. v, b.d. 27/6/38. Breasts full. Tab. v, b.d. 28/6/38. Breasts normal
46	25	1	19/3/38	Mother "chesty"	31/3/38. Tab. v, b.d. 4/4/38. Breasts comfortable
47	24	1	12/8/38	Tuberculosis of mother	12/8/38. Tab. v, b.d. 13/8/38. ,, ,, 15/8/38. Breasts full. Tab. v, b.d. 18/8/38. Breasts painful. Tab. ii, 2-hourly 19/8/38. Breasts normal
48	30	3	27/7/38	Tuberculosis of mother	31/7/38. Tab. v, b.d. 1/8/38. ,, ,, 2/8/38. Breasts full. Tab. v, b.d. 3/8/38. Breasts normal
49	34	3	14/5/38	Pyrexial cold of mother	4/7/38. Tab. i, hourly; 10 doses 5/7/38. ,, ,, ,, 6/7/38. Breasts comfortable
50	29	2	12/2/38	Pyrexia of mother and catarrh	4/4/38. Tab. i, hourly; 10 doses 5/4/38. ,, ,, ,, 6/4/38. ,, ,, ,, 7/4/38. Breasts comfortable
51	41	4	31/12/38	Illness of mother	31/1/38. Tab. ii, 2-hourly 1/2/38. ,, ,, 2/2/38. ,, ,, 3/2/38. Breasts comfortable

Table showing Case Details (concluded)

Case	Age	Para	Birth	Indication	Treatment and Results
52	25	1	27/12/37	Illness of mother	17/1/38. Tab. ii, 2-hourly 18/1/38. ,, ,, 19/1/38. ,, ,, 20/1/38. Breasts comfortable and soft
53	39	2	12/12/37	Weaning for adoption	14/1/38. Tab. ii, every 4 hours 15/1/38. Tab. ii, 4-hourly 16/1/38. Tab. ii, 2-hourly 17/1/38. ,, ,, 20/1/38. Breasts comfortable
54	21	1	22/2/38	Weaned 5/3/38	5/3/38. Tab. v, b.d. 8/3/38. Breasts normal
55	23	1	15/3/38	Weaned for adoption	5/4/38. Tab. v, b.d. 8/4/38. Breasts normal
56	34	2	14/6/37	Weaned for operation on mother	18/8/38. Tab. v, b.d. 19/8/38. ,, ,, 21/8/38. Less milk 22/8/38. Breasts comfortable
57	27	2	26/7/38	Weaned ..	6/8/38. Tab. v, b.d. 8/8/38. Breasts normal
58	26	1	4/8/38	Weaned for adoption	7/8/38. Tab. v, b.d. 8/8/38. ,, ,, 9/8/38. ,, ,, 15/8/38. Breasts soft 17/8/38. Breasts normal
59	24	3	8/6/38	Breast abscess	15/6/38. Tab. i, hourly; 10 doses 16/6/38. Tab. i, hourly 17/6/38. ,, ,, 18/6/38. ,, ,, 19/6/38. Breasts normal and soft
60	25	1	7/11/37	Breast abscess	20/1/38. Tab. ii, 2-hourly; 6 doses 21/1/38. ,, ,, ,, 22/1/38. ,, ,, ,, 23/1/38. ,, ,, ,, 24/1/38. ,, ,, ,, 25/1/38. ,, ,, ,, 26/1/38. ,, ,, ,, 27/1/38. Comfortable and soft
61	29	1	10/5/38	Breast abscess	18/8/38. Tab. ii, 2-hourly 19/8/38. ,, ,, 20/8/38. ,, ,, 21/8/38. ,, ,,
62	28	2	4/7/38	Puerperal mania	20/7/38. Tab. v, b.d. 28/7/38. Breasts full again. Tab. v, b.d. 31/7/38. Breasts normal

Southmead Municipal Hospital, where facilities were ideal.

The particular indications which made it necessary to suppress lactation are tabulated below, with the number of each type treated in this series.

Stillbirth, miscarriage, or monstrosity	31
Death of child	11
Disease or illness of mother (tuberculosis, disease of heart, eclampsia, etc.)	10
Weaning for adoption or operation	6
Breast abscess	3
Puerperal mania	1

Method of Treatment

The older method of using belladonna plasters has long since been discarded, and at the present time great reliance is placed on the use of saline aperients such as magnesium sulphate, given frequently, fluids being restricted, as well as binding and supporting the breasts. In the large obstetrical unit of Southmead Hospital it has been found that this gives the nursing staff much extra work; for if lying-in treatment is conscientiously carried out the frequent attention with bed-pans is a great trouble, while the use of considerable numbers of sterile pads is an additional expense. At the same time this treatment is distressing to the mother, and may still further weaken a patient whose resistance is already

reduced by a difficult labour. For these reasons such a simple method as oral follicular hormone therapy is welcomed.

In the beginning two doses of five dragees each were given twice daily. The preparation used was progynon (Schering), and each dragee contained 1,000 I.U. of oestrone. In many cases this dose was found to be sufficient, and rapidly all engorgement of the breasts had ceased and the patients became much more comfortable. Sometimes the treatment was continued for two to six days. Later, with the idea of keeping up a continuous supply of inhibitory hormone, five doses of two tablets each were given two-hourly throughout the day, while some patients received one dragee hourly during the day, and also during the night if they were awake.

Results in sixty-two cases have been consistently satisfactory. The ideal method is to start treatment soon after delivery, giving two doses of five tablets each on the first day, following with five divided doses of two tablets each, two-hourly, on the succeeding day or days if necessary. If treatment is not begun until the third day, or later still, it may be necessary to continue two tablets two-hourly for two to four days. No fluid restriction or aperients are necessary, and even binding of the breasts may be omitted in most cases, the support of a brassiere being adequate. The average effective total dose is twenty to thirty tablets, which for hospital practice represents a cost of approximately 3s. to 4s. 6d. It may be argued that magnesium sulphate is much cheaper, but this is offset by the saving in nurses' time and the cost of sterile dressings, whilst many patients who have experienced both forms of treatment for the suppression of milk have no hesitation in their preference for this oral therapy. The nursing staff are most enthusiastic about the method, which has reduced their labours and at the same time relieved many mothers of anxiety and distress.

Later in the period of lactation this therapy has been found of great value for breast abscess. It is suggested that by suppressing lactation at the onset of engorgement and congestion, with attempts at localization, the duration of the case is shortened considerably, and, if an abscess forms, this can be dealt with much more easily in the absence of active milk secretion. The most noticeable effect is the rapid softening of hard, swollen, congested breasts, with almost immediate relief of discomfort: but if the tablets are given immediately after parturition the breasts remain soft and comfortable. However, some milk may be forcibly expressed for many days, and complete disappearance of all milk in the ducts may take some time.

The dosage found to be effective in this series of sixty-two cases was:

5 tablets b.d. for 1 day, successful in 26 cases.
5 tablets b.d. repeated for 2 to 3 days, successful in 21 cases.
2 tablets every two hours in 5 doses for 1 to 4 days, successful in 12 cases.
1 tablet hourly in 10 doses for 2 to 3 days, successful in 3 cases.

The time after the birth of the child when treatment was begun is here shown:

Time	Patients	Time	Patients
1st day	9	11th day	1
2nd ,,	16	12th ,,	2
3rd ,,	10	16th ,,	1
4th ,,	9	5th week	1
5th ,,	3	8th ,,	1
6th ,,	1	11th ,,	1
7th ,,	2	12th ,,	2
8th ,,	1	13th ,,	1
10th ,,	1		

Breasts were comfortable and soft in two days in eighteen patients, in three days in nineteen, and in four days in fifteen (a total of fifty-two); whilst, of the remaining ten cases, in five days two were comfortable, in seven days five, and in six, ten, and eleven days one each. Thus fifty-two cases (84 per cent.) were comfortable within four days, and in the remaining ten cases a marked relief in tension was noticed but the breasts did not regain normal comfort until a few days later.

Discussion

Experience in a few cases of acromegaly and thyrotoxicosis when attempting to inhibit anterior pituitary function in human beings (Foss, 1937), together with Zondek's statement (1936) regarding the quantity of oestrogen necessary to retard growth and gonadotropic function in rats, makes it difficult to realize that oral oestrone in doses of 20,000 to 30,000 I.U. given over a period of two to six days can inhibit a function of the anterior pituitary. Normally this is only held in check by massive amounts of oestrogen and/or progesterone in the placenta. It is much more possible, in our view, that oestrone acts specifically on the mammary gland, in some way preventing the action of the lactogenic hormone of the anterior pituitary, or even by a direct antagonism to this lactogenic hormone. At present an explanation of this clinical finding cannot justifiably be ventured. It is unlikely that such small doses will in any way influence the chemical constitution of human milk.

We should like to acknowledge our thanks to Dr. S. J. Folley for his helpful criticism, to Dr. R. H. Parry for facilities for carrying out much of this research in the Southmead Municipal Hospital, Bristol, and to Dr. Neumann of Schering, Ltd., for samples of "progynon" dragees which were supplied for the early cases.

References

Adrian, J. (1938). *Gynéc. et Obstét.*, **37**, 178.
Brea, A. M., and Gándara, C. C. S. (1937). *Sem. méd.*, B. Aires, **44**, ii, 1463.
Folley, S. J. (1936). *Biochem. J.*, **30**, 2262.
—— (1938). *Lancet*, **2**, 389.
—— and Kon, S. K. (1938). *Proc. roy. Soc.*, B, **124**, 476.
—— and Watson, H. M. Scott (1938). *Lancet*, **2**, 423.
Foss, G. L. (1937). Unpublished work.
Herold, L. (1938). *Zbl. Gynäk.*, **62**, 155.
Kemp, T., and Pedersen-Bjergaard, K. (1937). *Lancet*, **2**, 842.
Kurzrok, R., Bates, R. W., Riddle, O., and Miller, E. G. (1934). *Endocrinology*, **18**, 18.
Lindemann, W. (1938). *Zbl. Gynäk.*, **62**, 159.
Nelson, W. O. (1936). *Physiol. Rev.*, **16**, 500.
Ross, J. R. (1938). *Endocrinology*, **22**, 429.
Selye, H., Collip, J. B., and Thomson, D. L. (1934). Ibid., **18**, 237.
Zondek, B. (1936). *Lancet*, **2**, 842.

The National Smoke Abatement Society (Chandos House, Buckingham Gate, S.W.1) has published under the title of *Britain's Burning Shame* a survey of the ravages caused by atmospheric pollution. This pamphlet, with profuse illustrations, is presented in simple terms. A foreword by Professor John Hilton emphasizes that smoke, which he describes as aerial sewage, is not a necessary evil. Emphasis is placed upon the ceaseless fight of women against dirt and dust, much of which results from the smoke-laden atmosphere in which the majority of the population is compelled to live. The bare facts here marshalled in simple fashion present a dramatic picture of the smoke menace, which competent authorities have estimated costs us not less than £40,000,000 a year. The smoke pall over towns and cities, often shutting out at least half the sunlight, encourages in children diseases of darkness like rickets. The tarry matter and acids contained in the soot increase the sufferings of those affected by respiratory diseases, as shown by the increases in deaths from these diseases during periods of protracted fog. Added to this is the psychological effect upon hundreds of thousands of the population who live in conditions approximating to perpetual gloom.

Clinical Memoranda

Cure or Relief of Cases Misdiagnosed "Angina of Effort"

The diagnosis of angina of effort is by no means easy in every case. The symptoms of fibrositis may simulate it very closely, not only symptomatically but in their response to nitroglycerin.

The curable cases referred to here are those of fibrositis of the chest wall with pain resembling angina, and are relieved immediately by trinitrin tablets. The practitioner labels these cases angina because they are relieved by trinitrin, forgetting that Sir William Gowers used to treat brachial neuritis (that is, fibrositis) with liquor trinitrini and tincture of gelsemium.

The treatment of cases in which the pain is due to fibrositis consists in breaking up the nodules with the fingers, using considerable force. The method is very painful, but after four manipulations the pain is much less. In every case that is diagnosed angina the practitioner should carefully search for nodules or painful areas under the clavicles and over the sternum and costosternal joints. Even if these are not found or a grating sound is not elicited fibrositis is present if there is abnormal tenderness or pain on pressure. To find the nodules most easily the fingers should be placed at right angles to the skin of the chest wall as if they were clawed, and be moved up and down the chest wall. Where the nodules are felt and where tender places are found the whole of the chest, back and front, should be treated, using considerable pressure. This should be done not less than four times a week—once a week would be useless—for eight treatments, and if necessary be repeated after an interval of a fortnight. Sometimes it is difficult to find the nodules or the tender points at the first attempt.

Perhaps these cases of pain in the chest may account for some of the 11.6 per cent. of those referred to by Dr. Geoffrey Bourne and R. Bodley Scott (1938) in which no cardiovascular cause could be found. In my practice I have come across four cases in two years. In all of them the pain was felt chiefly on walking.

Case I

This patient, a man aged 59, had had acute pain in the chest and the left arm for ten and a half months. In August, 1936, he had taken on an average nine trinitrin tablets daily—that is, a total of 279. Treatment was begun on September 1, 1936, and after four manipulations the daily average of trinitrin tablets taken was one. During the last eighteen months he has had only two tablets, and forty in all since the treatment was begun. The blood pressure, heart, and electrocardiograms were satisfactory. This was a case of fibrositis without heart abnormalities.

Case II

This case, that of a man aged 65, was diagnosed in July, 1936, as angina. The blood pressure was satisfactory, and nothing of consequence was observed in the cardiovascular system. Electrocardiograms were normal. In October I began treatment, two series of eight being given. Since March, 1937, he has not had to take trinitrin tablets. A case of simple fibrositis with no cardiac abnormalities.

Case III

Previously seen by his doctor, this patient, a man aged 53, had had his case diagnosed as angina. When I saw him his blood pressure was 240/135 mm. Hg, and his electrocardiograms were not normal. In this case I made three examinations before I found fibrositic nodules. The patient has had some twenty-four treatments, and can now walk a few miles. Formerly, though having to go less than half a mile to his work, he had to take a trinitrin tablet and often to travel by taxi. This patient never takes trinitrin now when walking or working. This was a case of fibrositis with cardiac abnormalities, but the pain was apparently due to the fibrositis.

Case IV

This patient was a woman aged 60 whose heart was apparently normal. No electrocardiograms were taken. Her blood pressure was 240/120. She has had sixteen manipulations and never has to take trinitrin. Evidently in this case the pain was due to fibrositis.

Case V

A colleague of mine to whom I had spoken of this condition tells me of a lady aged 55 whose case was diagnosed as angina and coronary thrombosis. She was continually having pains, and her husband had been given a gloomy report of her condition. She was sent to a nursing home in October, 1937, and was there six weeks. She remained most of the time in bed at home until July, 1938. This time my colleague, remembering our conversation, looked for and found fibrositis and himself gave her ten treatments. She is now well and free from pain. At one time she took six tablets of trinitrin a day. Hers was a case of coronary thrombosis, but the pains were due to fibrositis.

The first four of these patients are all able to continue at their work.

Conclusions

1. Certain cases with pain in the chest resembling angina of effort, and relieved by trinitrin, are curable. They are not cases of angina, yet are diagnosed as such. Sir William Gowers confirmed the relief trinitrin gives in some cases of brachial neuritis (fibrositis). These are cases of fibrositis without heart abnormalities.

2. There are other cases presenting heart abnormalities (high blood pressure, electrocardiographic changes, etc.), yet the pain is due to fibrositis. If treated the pain on exertion disappears.

3. Fibrositis should always be looked for when the blood pressure and the cardiac system are normal, even if the symptoms resemble angina of effort and the pains are relieved by trinitrin tablets.

4. Diagnosis of angina is serious for the patient: it may bring his work to an end and cause great anxiety to his family. By the treatment described the patient may be reprieved if the case is one of simple fibrositis, and the pain disappears in those cases with cardiovascular lesions in which fibrositis is the cause.

5. The doctor should either perform these manipulations himself or carefully supervise them, and so minimize the risk of failure.

Ealing, W.5. R. Halstead Dixon, M.B.

Reference

Bourne, Geoffrey, and Scott, R. Bodley (1938). *British Medical Journal*, **1**, 55.

We have received the fourth number of the ninth volume of the *Index to the Literature of Food Investigation*, dated March, 1938, which deals with papers received between October 1 and December 31, 1937. It is announced that in future each annual volume will be issued in four quarterly numbers, dealing respectively with papers received up to March 31, June 30, September 30, and December 31. Copies of the latest issue may be obtained from H.M. Stationery Office, London, W.C., price 4s. 6d.

Reviews

BRITISH MOSQUITOS

The British Mosquitoes. By J. F. Marshall, C.B.E., M.A., F.R.E.S. (Pp. 341; 172 figures, 20 plates. 20s.) London: British Museum (Natural History). 1938.

Mr. J. F. Marshall's *British Mosquitoes* takes the place of Dr. W. D. Lang's *Handbook of British Mosquitoes* published eighteen years ago by the Trustees of the British Museum and now out of print. The main purpose of the present work is to bring together all the accumulated information regarding British mosquitos, and especially to provide up-to-date descriptions and methods for identifying these insects in all stages of their development. Apart from the entomological point of view, it is essential in the interests of public health that we should have this complete and up-to-date work of reference so that the identification of our mosquito pests can be made with accuracy. Accurate identifications mean avoidance of unnecessary labour and expense in control operations.

The collection, selection, and arrangement of the material for the volume have been done logically and successfully. The chapters begin with "How to recognize a mosquito" and pass on to descriptions of external and internal anatomy of all stages. Next comes the main portion, devoted to detailed descriptions of the British species, together with an account of their breeding places and habits. These chapters are well illustrated by photographs and by clear diagrams of diagnostic features. The synoptic keys to species, both for adults and for larvae, are extremely useful for rapid identifications. The final chapters contain information regarding "control," some general remarks on biology, and notes relating to malaria in Britain.

We learn that there are twenty-nine different species in Britain, though not all require human blood as food. The problem of the man-biting and man-ignoring species of the genus *Culex* is discussed in some detail. Entomological literature frequently records that the common mosquito, *Culex pipiens,* rarely, if ever, attacks man, and yet this mosquito has, on many occasions, been accused of causing annoyance to man. Recently it has been shown that two distinct species have been confused under the name *pipiens.* This name is now reserved for the man-ignoring form and the name *molestus* for the man-biting form. Very little is known about the life-history of *molestus* under natural conditions. What is known has been in great part due to investigations made in response to inquiries from medical officers of health and general practitioners; otherwise, this mosquito has been studied only in the laboratory.

Another recent discovery, that *A. maculipennis* is divisible into several "races," is discussed in so far as it affects Britain, where only two of the "races" are found. This discovery helps to solve some of the problems relating to the distribution of malaria, particularly the phenomenon of the disappearance of the disease from an area, though anophelines are still present in large numbers. "The almost complete disappearance of ague (*i.e.,* malaria) from England is only now commencing to be satisfactorily explained." Fortunately, cases of mosquito-borne disease in Britain are now hardly ever recorded, so that suppression or control of mosquitos in this country is called for not because they are disease carriers but because of the nuisance and annoyance they cause by their bites. Breeding places and conditions (well illustrated and described) are so different for different species that Mr. Marshall rightly stresses the importance of accurate identification of the offending mosquitos before starting measures for control. He points out that haphazard scattering of larvicides may do untold harm. He says: "To apply antilarval treatment to innocuous collections of water, while the inhabitants of the district are being bitten by mosquitos coming from some neighbouring wood or from a coastal marsh two or three miles away, is not only a waste of public money but also diminishes confidence in mosquito-control work generally."

Throughout the book the author indicates where fuller information on related subjects can be found. For instance, in his chapter on control he rightly considers that descriptions of methods, materials, etc., employed in mosquito-control work would be out of place in a book of this nature, and the reader seeking further details is referred to the relevant literature; references to recent studies in insect physiology also occur, but consideration of such advanced work is purposely omitted as being beyond the scope of the present volume. A bibliography containing some two hundred references and an adequate index round off a volume that will be constantly consulted by many whose work includes the investigation of complaints of annoyance caused by mosquitos.

ENCYCLOPAEDIA OF MEDICAL PRACTICE

The British Encyclopaedia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynaecology, and other Special Subjects. Volume VIII: Leukaemia to Mucous Colic. Under the general editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D. (Pp. 664 (and 48 pages of index); 52 figures; 13 plates, many in colour.) London: Butterworth and Co. 1938.

The eighth volume of the Encyclopaedia opens with an excellent review of the subject of leukaemia by Dr. Janet Vaughan. In the absence of known aetiological factors, a classification according to the morphology of the blood cells is the most convenient. But the process may begin with a riotous profusion of growth of cells from any stage in blood development, though there are three main types—leukaemias dependent upon hyperplasia of the reticulum of the bone marrow, of the lymphoid tissue, or of the histiocytic cells of the sinus reticulum. All these may occur in an acute or in a chronic form, and not all the leukaemias show abnormal numbers of cells in the circulating blood. These varied types are described and illustrated. Lung diseases in their various aspects occupy an important place in this volume: collapse, circulatory disturbance, infections and their after-effects, and tumours; while there is a useful section on post-operative complications, ranging from bronchitis to lung abscess and pulmonary embolism. Liver disease, too, is dealt with in a series of articles preceded by a summary of liver-function tests. French authors have found the distribution of cholesterol and its esters in the blood a useful guide to liver efficiency, but no test, as Dr. Aitken points out, can do more than assess one of many aspects of liver function. Sir Leonard Rogers clarifies the position of tropical liver in medicine, and Sir Rickard Christophers contributes a full and informative study of malaria, not only the medical aspects being dealt with but also the important problems of parasitology and prophylaxis.

Other system diseases included in this volume are those of the lymphatic glands and vessels, the mediastinum, the motor neurone, and an important contribution on mouth

diseases in which Mr. Rock Carling discusses diseases of the lips, tongue, jaws, and palate. Sir Arthur MacNalty's broad discussion of the problems of maternal mortality covers the progress that has been made by private and Government interest in the subject, the improvement of training and of the status of midwives. He emphasizes that the evidence available shows that the maternal mortality, which has been reduced considerably (from 19 per 1,000 live births in the middle of last century to 4 per 1,000 at the present day), and which compares not unfavourably with that of other countries, is capable of further reduction. The prevention of maternal mortality is, however, a complex task, a problem of public health as well as of obstetrics.

As in former volumes, the editors have included articles on general subjects of medicine: the growing relationship of it to the law makes it necessary for the medical practitioner to have at hand reliable guidance on his conduct in relation to the world outside his practice. In this volume there are commendable articles on the functions of the medical witness, his conduct and evidence in courts of law; the duties and responsibilities of a medical examiner in medico-legal matters; the notification of criminal cases, of births and deaths, of infectious disease, of mental illness, and of notifiable industrial diseases; claims for compensation for accident and diseases under the Workmen's Compensation Act, 1925. The other subjects dealt with maintain the high standard which has been set in those volumes of the encyclopaedia which have already appeared.

INJURIES TO KNEE LIGAMENTS

On the Injuries to the Ligaments of the Knee Joint. A Clinical Study. By Ivar Palmer. Acta Chirurgica Scandinavica. Volume LXXXI. Supplementum LIII. (Pp. 282; 97 figures. No price given.) Stockholm: Tryckeri Aktiebolaget Thule. 1938.

Though it may appear illogical to separate ligamentous injuries of the knee from meniscus injuries and intra-articular fractures, there is something to be said for directing attention to this group of injuries that seems to have escaped systematic study. There is hardly any aspect of meniscus injury that has not been thoroughly investigated by British surgeons, and yet, somehow, we have neglected injury of the ligaments of the knee. Dr. Ivar Palmer of Stockholm has written a remarkably complete work based on a study of fifty-eight cases, and he has dealt with the subject from every point of view. It must at once be said that his monograph does not make easy reading. In the first place, 280 pages is a generous allowance for so small a group of injuries, and the approach is such that one cannot gain anything by skimming through the author's paragraphs of careful observation and close reasoning. It is almost impossible to give an informative précis of his work. The monograph is written for the studious specialist.

So far as diagnosis is concerned, one method demands our immediate attention. Palmer believes that the injection of radio-opaque fluid into a joint to demonstrate intra-articular abnormalities is now no longer an interesting clinical experiment. In his hands it is an established method, and his pictures are superb. If anyone doubts the possibilities of this aid to diagnosis he should look at Figs. 71 and 72, the first showing normal cruciate ligaments and the second a gap in the anterior ligament. Arthrography shows not only such intra-articular derangements, but a tear in the capsule is revealed by leakage into the soft parts around the joint. Pellegrini-Stieda "disease," although discussed in full, is assigned the unimportant place that it deserves. It is possible that there may be more than one cause for the curious sickle-shaped shadow found in the region of the medial femoral condyle, but there is no doubt that in most cases it is due to bone formation in or about the internal lateral ligament, and that it is a late and often symptomless result of injury.

To British readers the advocacy of open operation for a number of ligamentous injuries will come as a shock. It is agreed that the immediate results of conservative treatment, in injuries to the cruciate ligaments, for example, are on the whole satisfactory. But, asks Palmer, what about the late results? The findings at operation show that anything approaching adequate natural repair is often out of the question, and this is bound to prejudice the late results of conservative treatment. Operative repair is therefore advised. Unfortunately Palmer does not proceed to the necessary proof of his contention, for his cases treated by operation are too recent for him to show the superiority of the late results over those obtained by conservative means. It must never be forgotten that theoretical excellence is no guarantee of the success of an operative procedure, and, conversely, there are many methods, shockingly unsound in theory, that yield splendid and permanent results in practice.

DYSMENORRHOEA

Dysmenorrhoea: its Aetiology, Pathology and Treatment. By Albert A. Davis, M.D., Ch.M., F.R.C.S. (Pp. 254; 34 figures, including a coloured frontispiece. 12s. 6d. net.) London: Oxford University Press. 1938.

Though dysmenorrhoea is one of the commonest gynaecological disorders, and one in explanation of which theories have been propounded for centuries, Mr. Albert Davis has made what is perhaps the first really serious attempt to correlate the existing ideas on the subject. That he has approached his task with great thoroughness may be judged from the almost wearying sequence of references—numbering over five hundred and fifty in all—which the reader encounters on practically every page. Beginning with a historical survey of considerable interest, the author deals with every aspect of his subject, even devoting one whole chapter to "nasal, vicarious, and dermatitic dysmenorrhoea." In view of his belief in the neurogenic theory of the aetiology of dysmenorrhoea, it is perhaps not remarkable that Mr. Davis has devoted a quarter of his book to this subject. But his claim that the theory "is based on a sound theoretical foundation, has the advantage of reasonable clinical and pathological proof, has provided the rationale for sympathectomy, and is, moreover, strongly supported by the results of that operation," may be disputed by some clinicians and pathologists, and might even be challenged by the judicially minded reader after careful weighing of the evidence submitted by the author himself in support of his claim.

The anatomy of the autonomic system is admirably dealt with, as also is the technique of alcohol injection in the pelvic plexuses; but the indications for pre-sacral neurectomy, while pathologically concise, are too indefinite to be of practical assistance to the clinician. The author's analysis of the results of this operation is rather indefinite, despite the fact that with characteristic thoroughness he has reviewed all the published reports up to 1936. In claiming 50 to 75 per cent. of cures in carefully selected cases treated by sympathectomy, Mr. Davis makes no mention of the size of his series, though knowledge of this fact is essential to the reader if he is to assess the true value of the statistics.

The part of the book dealing with the histopathology of the pelvic autonomic system contains most excellent photomicrographs beautifully reproduced and clearly illustrating the points described in the text. The neurogenic theory largely depends for its pathological proof on the interpretation of these sections. The opinions expressed by Mr. Davis may be perfectly correct; but if, in order to distinguish the pathological from the physiological, it is necessary to assess quantitative changes, the sceptic must be pardoned if for the time being he considers the case for this theory as "not proven."

For all interested in the theory and practice of gynaecology this book contains a wealth of useful and concisely arranged information on all aspects of the difficult subject of dysmenorrhoea.

NEURORADIOLOGY

A Textbook of Neuroradiology. By Cecil P. G. Wakeley, D.Sc., F.R.C.S., and Alexander Orley, M.D., D.M.R.E. (Pp. 336; 229 figures. 25s. net.) London: Baillière, Tindall and Cox. 1938.

The application of radiographic technique to the localization of cerebral and spinal tumours has developed so rapidly of recent years that it is surprising to learn that no book has hitherto been published which deals with this subject as a whole. The *Textbook of Neuroradiology* by Mr. Wakeley and Dr. Orley will go far to fill this gap. Its most valuable chapters are those dealing with the methods which have been devised to demonstrate the foramina in the base of the skull and the exact position of cerebral tumours as shown by ventriculography or encephalography. These methods are most easily carried out by the use of Lysholm's special apparatus, but the authors state that "the projections can be obtained with any flexible radiographic plant." The chapters on diseases of the skull and spine and the diagnosis of cerebral tumours by lateral and antero-posterior views cover well-known ground and add little that is new. Indeed, some of the conditions illustrated have so little bearing on neurology that they might well have been omitted, as might also the short chapter on the cerebrospinal fluid system. The chapter on cerebral arteriography is clear and succinct, but since this method is chiefly used at the present time in the diagnosis of intracranial aneurysms and angiomas it is surprising that all the illustrations in this chapter are from cases of cerebral tumour.

Lesions of the spine and spinal cord receive less space than they deserve. No doubt this ground has been so fully covered in other books on radiological diagnosis that the cursory survey given here may be adequate for its purpose. But it is surprising that no mention is made of the careful studies by Dyke and Davidoff of the separation of the pedicles at the level of intraspinal tumours. The only reference to this is that "erosion and thinning of the mesial border of one or both pedicles" may be seen in the antero-posterior view. In actual experience minor degrees of erosion are not easily seen, and are only revealed by carefully controlled measurement.

If the book as a whole is disappointing it is chiefly owing to a certain lack of balance. The problems that face the neurologist and the neurological surgeon are often cursorily dealt with, whereas there is over-elaboration of details which are more in the province of the general surgeon and physician. No doubt this will commend the book to a rather wider public, but it also detracts from its value to the radiologist who is called in to help in neurological cases.

Notes on Books

The second edition of Drs. Pearson and Hepburn's book on *Physiological and Clinical Chemistry* is specially suited to those medical students whose knowledge of organic chemistry is only superficial, for it is unusual among such books in providing a summary of the principles and main facts of that subject, in addition to the chapters on fats, carbohydrates, and proteins. In other respects their volume proceeds on fairly familiar and, it must be added, sound lines. Its least satisfactory feature is an arrangement which entails the complete dissociation of the principles from the practice of many analytical methods. The book is published by Henry Kimpton, and the price is 25s. net.

The Contribution of Alfred Adler to Psychological Medicine, by several authors, is No. 19 of the Individual Psychology Pamphlets (London, C. W. Daniel, 2s. 6d.). It contains a series of essays reviewing Adler's work in relation to philosophy, psychological medicine, organ inferiority, the relation of the sexes, and to general medicine, the last an admirable paper by Sir Walter Langdon-Brown. There are added a short description of Adler's conferences for teachers in Vienna and a personal appreciation of Adler himself. This is an interesting little book and gives the reader a very fair summary of Adler's work, though it is of course too slight to serve as a textbook of his methods. For that, however, the beginner can go to other sources, while the initiated will be pleasantly reminded of what he already knows.

Adventures in Respiration, by Professor Yandell Henderson, which was reviewed on October 15, at page 790, can be obtained in London from Messrs. Baillière, Tindall and Cox for 13s. 6d. net.

Preparations and Appliances

CAIDEFERRUM TABLETS

"Caideferrum" tablets (Glaxo Laboratories Ltd.) contain ferrous iron (25 mg.), a calcium salt (0.5 gramme of metal), and vitamin D (2,000 international units). The tablets are intended for prophylactic use, particularly in pregnancy to protect the mother against deficiency of iron, calcium, or vitamin D. The manufacturers emphasize the fact that the tablets are intended to prevent and not to cure these deficiencies.

EMPIRIN WITH CODEINE

Tabloid empirin (acetyl-salicylic acid) compound with codeine (Burroughs Wellcome and Co.) contains acetyl-salicylic acid, phenacetin, caffeine, and codeine. It is a combination which has, in therapeutic practice, been found effective in relieving pain, even when this is of considerable severity.

PLANTAGO FIBRE FOR CONSTIPATION

"Siblin" (Parke, Davis and Co.) is composed chiefly of highly water-absorbent fibre derived from certain species of plantago. It also contains 50 international units of vitamin B_1 in each teaspoonful. The preparation is intended for the relief of chronic constipation. It has a pleasant taste and is convenient to take. It is not absorbed or broken down in the intestinal tract, is non-irritant, and provides ample faecal bulk with optimum consistency. The vitamin B_1 facilitates improvement of intestinal muscular tone and peristaltic activity.

INTRAVENOUS STROPHANTHIN

"Kombetin" (Coates and Cooper Ltd.) is a preparation of strophanthin (Boehringer). It is supplied in 1 c.cm. ampoules containing 0.5 mg. of the drug, and is intended for intravenous administration.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY OCTOBER 29 1938

FOOD AND NUTRITION

The results of an inquiry into the food habits and food consumption of British people, undertaken by a firm of advertising specialists, have been brought together in a book called *The People's Food*, by Sir William Crawford and H. Broadley.[1] The inquiry dealt with 5,000 families, comprising 18,500 individuals, of all social classes—wealthy, upper middle, lower middle, skilled working, unskilled, or unemployed—in seven urban centres: London and Birmingham, where economic conditions at the time of the inquiry were good; Leeds and Glasgow, where they were less good; and Cardiff, Newcastle, and Liverpool, where economic conditions were much below the national average. It was assumed that the aggregate figures obtained from such an inquiry would be representative of the bulk of the urban families; in other words, of nearly two-thirds of the population of Great Britain. After dealing with what people eat and drink at breakfast, "elevenses," midday lunch or dinner, tea, "high tea," and evening dinner or supper, with the times at which these meals are taken, with the manner of cooking them, with the buying of family food supplies, and with the prevailing lack of interest displayed by housewives in dietetic subjects, the authors come to the kernel of the matter: "food expenditure and income" and "food consumption and nutritional adequacy." The conclusion reached in regard to expenditure on food is that 17.52 per cent. of the population, or nearly 7,880,000 individuals, are living in homes where the "per caput" weekly expenditure on foodstuffs is below the minimum laid down by the British Medical Association (1933). As to the nutritional adequacy of the food consumed—arrived at by comparison with B.M.A., Stiebeling, and League of Nations standards—the conclusion is reached that between fifteen and eighteen million people consume inadequate quantities of calories, eighteen to twenty million inadequate quantities of protein, twenty-five to thirty-five million inadequate quantities of calcium, twenty to thirty-seven million inadequate quantities of phosphorus, nineteen to thirty-four million inadequate quantities of iron, thirty-seven to forty-four million inadequate quantities of vitamin A, twenty-four to thirty-eight million inadequate quantities of vitamin B_1, and twenty-one to thirty-three million inadequate quantities of vitamin C; the lower figures being those obtained by adopting "minimum" (B.M.A.), the higher those obtained by adopting "optimum" (League of Nations) standards.

It would seem that only half the working classes achieve the League of Nations requirements in calories and protein; while practically all its members fall very considerably short in their intake of calcium, phosphorus, iron, and vitamins. The middle classes, on the whole, are adequately provided with calories, protein, phosphorus, iron, and vitamin C, according to League of Nations standards, but are probably in need of greater quantities of calcium and vitamins A and B_1. In the wealthy class there is no real shortage, except in regard to vitamin A. "In all probability between twenty and thirty millions are living on diets which are inadequate when compared with the British Medical Association 'minimum' standards." Of these, eight millions have not the means to purchase foodstuffs that will provide this minimum diet, while twelve to twenty-two millions are spending weekly a sum sufficient to purchase these foodstuffs but are not expending their money wisely. "If a larger percentage of the public could be persuaded to adopt at least the British Medical Association diet, the nutritional standard of the nation, and consequently the health of a substantial proportion of the population, would be very considerably improved. If, however, they could be persuaded to base their diets on the still higher standards laid down by the League of Nations this well-being and happiness of the people of the country would be changed almost out of recognition." How is this persuasion to be effected? Sir William Crawford and Mr. Broadley have some valuable suggestions to offer: measures of an economic character to improve the lot of the poorest classes; education, of which enlightened advertising is an important form; further research on many outstanding problems of nutrition; and the establishment of a Food Research Institute to handle the food problems of the future, on which all those interested in health, nutrition, and food are represented. And who should sponsor such a campaign? Those who will derive most benefit from the establishment of a higher standard of diet for the people: industrial concerns, food distributing trades, food manufacturers, insurance companies, and agriculture. It may be doubted, however, whether agriculture, though it would benefit greatly by the establishment of a higher national diet, is at present in a position to sponsor anything. This book again makes clear the urgent

[1] *The People's Food*. By Sir William Crawford, K.B.E., and H. Broadley. London: W. Heinemann. (12s. 6d.)

need for a national food policy based on the knowledge of nutrition which science has provided during the past thirty years.

"Just as last century the advocates of preventive medicine fought the battle for proper sanitation, so this century they will fight the battle for proper nutrition. Just as to-day sound drains and clean water are the *sine qua non* of civilized life, so will a proper diet come to be regarded as the necessity of all classes of the community. . . . A national campaign is overdue to awake the public to a full understanding of the importance of the different foodstuffs for creating and maintaining healthy bodies. A 'keep fit' campaign cannot achieve success on exercise, fresh air, and sports only, important as these are. It must have as a foundation fully developed and healthy bodies, in the production of which food is, by far, the greatest factor."

The Changing World Library has recently been enriched by the inclusion in it of a book on a cognate subject, entitled *Science and Nutrition,* by Mr. A. L. Bacharach.[2] It tells, from the chemist's point of view, the story of the remarkable developments in the field of experimental nutrition during the past thirty years; and tells it simply and accurately as it can only be told by one who, as Professor J. C. Drummond says in his preface, "has not only been in close touch with all the important research work of recent years, but who has himself made many valuable experimental studies." The author's main task has been to put before the reader the kind of methods used in the laboratory study of nutritional problems and the kind of knowledge obtained thereby, so that he may be in a position to apply some degree of scientific criticism to the many dietary proposals that are regularly to be found both in the lay press and in the more technical journals. This task has been successfully accomplished. After dealing effectively with the use of animal experiments and with the criticisms that are often levelled against them, Mr. Bacharach provides for those who already possess some knowledge of human nutrition a "refresher course" in classical nutritional science: a course which serves also as an outline for those not in possession of this knowledge or who have forgotten the salient facts. This summary gives a succinct account of the major food constituents—carbohydrates, fats, proteins, and certain mineral elements—the recognition of whose importance belongs to the period of "classical" nutritional theories. The author then proceeds to discuss the "trace" elements, and by an easy transition passes to the vitamins which, "though of highly complex organic structure, do their jobs in quantities of the same order as the trace elements themselves." Finally, he comes to deficiency disease, pointing out the too restricted sense in which this term is generally used, it being often confined to the vitamin-deficiency diseases, although it must be held to include disease due to shortage of any essential constituent of food. Besides the clear-cut vitamin-deficiency diseases "it must never be forgotten," he says, "that partial vitamin deficiency, and especially partial deficiencies of more than one vitamin, are responsible for much of the general ill-defined bad health or 'malnutrition'" to which reference is made in earlier chapters. He stresses the need for the optimum in diet, affirming that one consisting largely of dairy produce, green vegetables, whole wheat, and meat or fish, with the additions of eggs and pulses, is pretty certain to be adequate in all essential dietary constituents, with the possible exception of vitamin D. The chemist, then, in his fragmentation of these natural foodstuffs by refined methods of chemical technique, reaches the same conclusion as those who, by their observations on man and animals, have shown that a diet composed of these natural foodstuffs in due proportion one to another contains all elements and complexes necessary for the efficiency of the function of nutrition and, therefore, for the maintenance of health so far as food is capable of supplying them; always provided that these foodstuffs are produced on soils which are not impoverished.

Mr. Bacharach lays down certain general propositions which will be accepted by most of those who have worked on nutritional problems in the laboratory or in the wider field of applied dietetics, or in both. First, that the results of animal experiments are applicable, with due caution, to the problems of human nutrition and health. Secondly, that inadequate feeding in quantity and quality of food is responsible for a vast amount of ill-health and definite disease. Thirdly, that improved dietary conditions would bring incalculable improvements to the health of vast numbers of people. Fourthly, that such improvement could to some extent be brought about by educational methods. Fifthly, that a far greater improvement would result from securing that all who serve the community by working are so remunerated as to make adequate expenditure on food possible for them all. And, sixthly, that such a possibility, whether brought about by a reduction in retail prices or an increase in wage levels, or both, would, in fact, lead to that improvement in diet necessary for general improvement in health. *Science and Nutrition* is the latest addition to a series of books, which includes one entitled *Science Fights Death,* and another entitled *The Nation's Intelligence.* It shows that science fights death—and disease—by revealing the essential constituents of food, their distribution in foodstuffs, their role in nutrition, and the effects of their inadequate supply.

[2] *Science and Nutrition.* By A. L. Bacharach, M.A., F.I.C. London: C. A. Watts and Co. (2s. 6d.)

THE RENAL PRESSOR SUBSTANCE

Forty years ago Tigerstedt and Bergman[1] observed that saline extracts of fresh rabbit's kidney, or of the dry residue left from extracting rabbit's kidney with alcohol, produced a prolonged rise of blood pressure when injected into the veins of the anaesthetized rabbit. The active substance, which they named "renin," was obtained only from the cortex of the kidney; it was thermolabile and non-dialysable, and its pressor effect persisted after the spinal cord had been destroyed. Although this work was confirmed and extended by Bingel and Strauss[2] in 1908, renin attracted little further notice until two years ago. Renewed interest in it has been aroused by two converging lines of work which have focused attention on the kidney as a probable source of some chemical disturbance resulting in raised blood pressure. The first of these was the demonstration by Goldblatt and his colleagues[3] that in the dog hypertension, in many features resembling essential hypertension in man, may follow constriction of the renal arteries, and the subsequent demonstration by several workers, among whom are Blalock and Levy,[4] that this hypertension is brought about by a humoral and not a nervous mechanism. The second was the evidence provided by Prinzmetal and Wilson[5] and by Pickering[6] that in persistent hypertension in man excessive narrowing is still exhibited by the vessels of the hand after removal of their sympathetic vasoconstrictor tone. The suggestion therefore arises that this form of human hypertension is due to vasoconstriction of chemical rather than of nervous origin; and again the kidney may be chiefly suspected as the source of such a chemical disturbance.

The idea that certain forms of hypertension are of renal origin is as old as Bright, and it is most surprising that so little work has been done on renin, the discovery of which dates but four years after that of adrenaline. Reference to work on renal extracts during the earlier years of this century makes it clear that many workers sought it, but few were able to obtain pressor responses consistently from renal extracts. A minor reason for this failure is that saline extracts of kidney contain also depressor substances which mask the pressor effects of renin. Both Tigerstedt and Bergman and Bingel and Strauss described methods whereby most of the depressor substances may be removed; the former extracted the kidney with alcohol and, discarding the filtrate, extracted the dry residue with saline; the latter prepared a total globulin fraction by half saturating a saline extract of kidney with ammonium sulphate. Recently Landis, Montgomery, and Sparkman[7] have described a third method, in which heating saline extracts of kidney to 56° C. for twenty minutes precipitates depressor material along with most of the protein, the resultant filtrate giving a pure pressor response in the unanaesthetized rabbit. A more important reason for the failure of earlier workers to detect renin is that the pressor action of renin is reduced or abolished by anaesthetics, as Pickering and Prinzmetal[8] have recently shown; for, of course, it has been, and still is, customary to test extracts for their vasomotor properties on the anaesthetized animal. There is now no doubt that renin is a normal constituent of the renal cortex of most species, and apparently confined to this. Its properties resemble those of a protein: thus it is destroyed by heating for two hours at 60° C., by strong acids and alkalis, and by alcohol at a temperature above 0° C. but not by alcohol at −10° C.; it is non-dialysable and appears chiefly in the pseudoglobulin protein fraction.[8]

As has been mentioned, there is a strong presumptive case for supposing that renin may be the agent responsible for certain forms of human and experimental hypertension. Landis, Montgomery, and Sparkman have shown that in one respect renin is the only chemical substance known whose behaviour is compatible with that of the agent in persistent hypertension in man. Thus in human hypertension the peripheral blood flow appears to be normal, and renin is the only known pressor substance which will raise the blood pressure in the unanaesthetized rabbit without simultaneously reducing the blood flow through its ears. More direct evidence is, however, needed, and several attempts have been made to detect increased quantities of renin in the kidneys of dogs with hypertension due to renal ischaemia, positive results being claimed by Harrison and his colleagues[9] and by Prinzmetal and Friedman.[10] A solution of this question demands some method for the assay of renin, and the great difficulty has been that the anaesthetized animal responds inconstantly to the substance. Pickering and Prinzmetal have, however, demonstrated that in the unanaesthetized rabbit the response to a given dose of renin is constant provided that sufficient time is allowed between injections for the blood pressure to return to its resting level. They have also found that the renin content of the dry residue left after extracting

[1] *Skand. Arch. Physiol.*, 1898, **8**, 223.
[2] *Dtsch. Arch. klin. Med.*, 1909, **96**, 476.
[3] *J. exp. Med.*, 1934, **59**, 347.
[4] *Ann. Surg.*, 1937, **106**, 826.
[5] *J. clin. Invest.*, 1936, **15**, 63.
[6] *Clin. Sci.*, 1935–6, **2**, 209.
[7] *J. clin. Invest.*, 1938, **17**, 189.
[8] *Clin. Sci.*, 1937-8, **3**, 211.
[9] *Proc. Soc. exp. Biol. N.Y.*, 1936, **35**, 38; *Arch. intern. Med.*, 1937, **60**, 1058.
[10] *Proc. Soc. exp. Biol. N.Y.*, 1936, **35**, 122.

rabbit's kidney with alcohol remains unchanged for many months if the preparation is kept cold. Using this preparation as a standard, and finding the doses of standard and unknown solutions which will give similar rises of blood pressure in an unanaesthetized rabbit, the renin content of the unknown solution may be assayed in terms of the standard. With this or some other similar method it should be possible ultimately to decide whether the renin content of the kidney is or is not altered in hypertension.

Finally, it may be said that although renin is at present most fancied as the agent responsible for hypertension the problem still remains open. There can, nevertheless, be no question that it is an interesting and hitherto much-neglected substance which must have some place in the economy of the body. What this place is cannot at present be stated, but more will certainly be heard of renin in the years to come.

COMPARATIVE STUDY OF CANCER OF THE ALIMENTARY TRACT

The study of cancer of the alimentary tract in animals and in different races and classes of mankind has revealed contrasts of great interest. Ruddock and Willis[1] describe a carcinoma of the stomach in a dog with the comment that the stomach is one of the rarest sites of cancer in dogs. Gastric cancer is equally, or almost as, rare in other animals. The significance of this contrast with clinical experience is discussed by Wells, Slye, and Holmes.[2] Their personal observations were made on 142,000 mice of Miss Slye's stock all dying from natural causes and mostly of cancer age. Although, according to earlier reports, there were more than 100,000 cancers in this series, there were no tumours of the oesophagus, only fifteen primary malignant tumours of the stomach, and only nineteen of the intestines; in eleven instances the intestinal tumour originated in a prolapsed rectum. Wells, Slye, and Holmes conclude that the lower animals escape the carcinogenic stimuli which assail the human alimentary tract. This inference needs close scrutiny. The frequency of cancer in the prolapsed rectum supports the essential assumption that the alimentary tract of mice is capable of developing cancer under suitable conditions, but the assertion that cancer can be easily produced experimentally in the stomachs of rodents will not pass unchallenged. Waterman produced squamous carcinomata in the fore-stomachs of mice by administering a carcinogenic substance; other investigators failed to produce tumours of any kind, and confidence in Fibiger's classical experiments on the production of gastric cancer by a parasite has been shaken by the observations of Passey and of Cramer. According to present views, cancer similar to gastric cancer in man might be produced in animals which rarely develop it spontaneously by applying a stimulus of suitable kind and intensity; but this has not yet been done. Success may depend on finding the appropriate stimulus. Susceptibility to the known carcinogenic agents varies greatly in different species of animals and in different tissues, and it is not certain that the stimuli which produce gastric cancer in man would be effective in mice. In contrasting gastric cancer in man and animals it is important to recognize that the incidence of human gastric cancer is not uniformly high. The greater incidence in the poor as compared with the rich was discussed by Sir Arthur Hurst in his Harveian Oration last year.[3] A promising field of investigation has also been opened in the Dutch East Indies. The incidence of gastric ulcer and of gastric cancer in the native Javanese is extremely low, while the incidence of both conditions in the Chinese resident in Java is similar to that in Western countries. Bonne and his colleagues[4] are investigating the possible causes of this difference. They avoid the seemingly endless dispute as to how often cancer supervenes on ulcer, but believe that ulcer and cancer must have at least one common aetiological factor. Gastritis, in general, and erosions were about equally common in Javanese and Chinese stomachs; it seemed, therefore, that some factor which in Chinese and Europeans converts an erosion into an ulcer was absent from the Javanese. Chronic atrophic gastritis and goblet-cell metaplasia were common in the Chinese; but more material is needed to show whether these are precancerous conditions. A comparison of the habits and diets of the two races is in progress, though the difficulties in the interpretation of observations of this kind are not minimized. These comparative studies may well yield results of great practical importance.

[1] *Amer. J. Cancer*, 1938, **33**, 205.
[2] Ibid., 223.

LUNG PHYSIOLOGY AND COLLAPSE THERAPY

The methods so far available for testing the functional capacity of the lungs are either not reliable enough or are too complicated for general use. The difficulties are due largely to two facts: the function of the lung depends on two related but distinct components—the volume of the respiratory exchange and the gaseous blood changes—and certain tests require exertion or movement which it may be impossible or inadvisable for some patients to undergo. An important advance has been made in the method of bronchospirometry, introduced by the late Professor Jacobaeus, which allows the function of each lung to be investigated separately. It calls for expert bronchoscopy and spirometric experience. We drew attention to the matter some time ago,[5] and a recent account[6] makes it clear that bronchospirometry offers much hope for the future of thoracic surgery. Kaltreider, Fray, and Philips[7] have carried out a detailed investigation in twenty cases of pulmonary tuberculosis treated by thoracoplasty. Measurements were made from seven months to ten years after opera-

[3] *British Medical Journal*, 1937, **2**, 783.
[4] *Amer. J. Cancer*, 1938, **33**, 265.
[5] *British Medical Journal*, 1935, **1**, 1032.
[6] *J. thorac. Surg.*, 1938, **7**, 235.
[7] Ibid., 262.

tion. In only two patients were the observations made both before and after the operation. The total pulmonary capacity and its subdivisions were determined, radiographic measurements were taken, and the oxygen saturation of the arterial blood and the morphology of the red blood corpuscles investigated. In order to study the effect of compression of the lungs on the right heart the venous pressure and velocity of the flow of blood were measured. The normal values for the capacity of the lungs (before operation) were predicted from the standing body weight. Thoracoplasty lowered the total and vital capacities; this reduction was roughly proportional to the number of ribs resected, and was greater when the phrenic nerve had also been paralysed. Thoracoplasty also diminished the ability of the patient to expand the chest. An anoxic anoxia in these patients was not associated with polycythaemia, and the morphology of the red corpuscles was normal. The venous pressure was slightly elevated, being higher on the operated side, and the blood velocity was slightly delayed. At rest and during moderate physical exertion patients with thoracoplasty had a rapid and shallow type of breathing compared with normal persons. A correlation was found between their degree of disability and the lowering of the vital capacity and pulmonary reserve. Harter, Overholt, and Perkin[8] determined the lung volume in seventy-two consecutive patients, and in thirty-two of them after thoracoplasty. Lambert, Berry, Cournand, and Richards[9] carried out a detailed study of the pulmonary and circulatory function of the lungs both before and after thoracoplasty in eleven patients, and conclude that the level of vital capacity is not a good criterion either of functional capacity (dyspnoea) or of operative risk; a more satisfactory index of dyspnoea is the ratio of actual to maximum ventilation. The problems raised in the above papers make it plain that further research is needed to establish collapse treatment of pulmonary tuberculosis on a more rational basis.

SKIN REACTIONS IN TOXAEMIA OF PREGNANCY

It was Zweifel who, in a moment of depression, called eclampsia "this disease of theories," a description which in view of the number and variety of the opinions on its aetiology remains more than justified. The field is, however, somewhat narrowed by the general acceptance of the basis of a circulating toxin, for though such a substance has never been specifically isolated its existence seems certain from the pathological changes found post mortem in the liver, kidneys, and reticulo-endothelial system, all of which excrete toxin. The clinical evidence is also confirmatory—the increase with advancing pregnancy, the reaction to eliminative treatment, the association with placental degeneration, etc. Attempts to identify the toxin biochemically have been unsuccessful, but its essentially allergic nature has recently been demonstrated by Belikoff and Manevitch.[10] It appears from their experiments that the serum of eclamptic patients produces a definite local reaction when injected subcutaneously into patients suffering from toxaemia of pregnancy. The reaction is specific for these cases, and is negative in non-pregnant or pregnant non-toxaemic patients. It is thus not only valuable confirmatory evidence of toxaemia, but by appearing actually before the onset of the ordinary clinical signs it allows of earlier diagnosis and prophylaxis of the disease. The technique is to inject subcutaneously into the arm 2 c.cm. of a 10 per cent. solution of the serum in physiological saline; a strongly positive reaction produces an immediate erythema and vesiculation, lesser degrees of toxaemia causing a slight delay. Apart from the diagnostic importance of this work, it is possible that such serum might be used with advantage as a desensitizing agent in known cases of pre-eclamptic toxaemia. Such a property is suggested by the extreme rarity with which eclampsia recurs in the same person (3 per cent. according to Bumm), and though clinical experiment must be delayed until further biochemical assay and standardization provide a reasonable margin of safety, it is possible that this new approach may aid materially in the reduction of the disease.

[8] *J. thorac. Surg.*, 1938, **7**, 290.
[9] Ibid, 302.
[10] *Gynécologie*, 1938, **37**, 466.

THE VIRUS OF LYMPHOGRANULOMA INGUINALE

Eight years ago the causal agent of lymphogranuloma inguinale was shown by Hellerström and Wassen[1] to be filterable, and was added to the rapidly growing group of viruses. Even before this, small granules had been described in the cells from inguinal buboes by Gay Prieto (1927), and similar granules were observed and figured by Findlay (1933), who expressed the view that these minute bodies were probably the virus. It was, however, the researches of Miyagawa and his colleagues some two or three years later which constituted the first detailed study of these minute bodies, and it is generally accepted to-day that they are, in fact, the virus. They are very small coccus-like particles measuring as a rule 0.125 μ to 0.175 μ, and they have been observed in virulent material of various provenance. Recently a note appeared by G. M. Findlay, R. D. Mackenzie, and F. O. MacCallum,[2] announcing that they had observed forms of this virus which resembled those described in psittacosis by Bedson and Bland[3] in 1932. It is interesting to note that the large form of lymphogranuloma inguinale virus seen by these workers occurred particularly in the early lesions, and that it often showed an appearance suggesting division by fission. Forms intermediate in size were observed; in fact, the different forms and their sequential relationship suggest that this virus passes through the same cycle of development forms as psittacosis. The only other virus in which a similar phenomenon has been observed is that of inclusion conjunctivitis,[4] although the inclusions seen in trachoma suggest that here also

[1] *Trans. roy. Soc. trop. Med. Hyg.*, 1933, **27**, 35.
[2] *Nature*, 1938, **141**, 877.
[3] *Brit. J. exp. Path.*, 1932, **13**, 461.
[4] *Amer. J. Ophthal.*, 1934, **17**, 1019.

the same thing occurs; and it may not be without significance that these viruses stain readily by Castaneda's method, whereas what one might term "typical" viruses like vaccinia, fowl-pox, herpes, and chicken-pox are not stained by this procedure. The staining method of Castaneda was devised by him for Rickettsia, and some of the appearances presented by Castaneda-positive viruses resemble what is found in the case of Rickettsia. It has in fact been suggested on more than one occasion that these particular viruses are Rickettsia. Lillie[5] has named the virus of psittacosis *Rickettsia psittaci*. Cuénod and Nataf[6] have stated that in their opinion the virus of trachoma is a Rickettsia, as is also, according to the view recently expressed by M. J. Caminopetros,[7] the virus of lymphogranuloma inguinale. It may well be that with increasing knowledge it will be found that the Castaneda-positive viruses and the Rickettsia should be grouped together and separated from the other viruses. At the moment, however, this indiscriminate use of the term Rickettsia is to be deplored. Rickettsia as a generic name is excusable on historical grounds, but it has no true biological sanction. Further, the one positive character possessed by the Rickettsia, apart from their morphology, which admittedly is definitely microbial, is that they all have an arthropod host. Cuénod and Nataf have claimed that the virus of trachoma is infective for lice, but the viruses of psittacosis, lymphogranuloma inguinale, and incidentally the agents described by Coles in South Africa in conjunctivitis of cattle, sheep, and goats, have not been shown to have an insect host; so with the possible exception of trachoma virus there is not even this excuse for calling them Rickettsia.

CARE OF LUNATICS IN NIGERIA

In a recent report[8] Dr. R. Cunyngham Brown deals with lunacy in Nigeria, the largest and most populous of the four British West African Colonies. After an extensive tour of the Northern and Southern Provinces he estimates that the proportion of mentally deranged people is not less than 2 per 1,000 of the population, and that there are probably some 40,000 persons in Nigeria who are either imbecile, epileptic, or insane. The vast majority of these people remain in their villages, where, on the whole, they are kindly and even solicitously treated, though they naturally suffer from the lack of medical attention and advice. Of this large total of 40,000 only 290 figure in the official returns of 1935 as lunatics or suspected lunatics, including 121 actually certified. An interesting point noted by Dr. Cunyngham Brown is that the incidence of lunacy appears to be just as large among the primitive peoples as among those Africans who have been brought into contact with Western civilization. Institutions for certified lunatics are stated to be far behind the times, while custodial detention is emphasized at the expense of remedial treatment. He stresses the desirability of the establishment of more asylums, and, in view of the fact that lunacy in Nigeria appears to be increasing, he advocates the provision of ample acreage to permit of further extensions. With regard to lunatics who remain in their villages, the building up of an organization to provide a measure of supervision and medical guidance is suggested. Dr. Cunyngham Brown also recommends the appointment to the medical services staff of a specialist officer thoroughly conversant with this branch of medicine.

[5] *Nat. Inst. Hlth. Bull.*, Washington, No. 161, 1933.
[6] *Arch. Inst. Pasteur, Tunis*, 1936, **25**, 295; 1937, **26**, 1.
[7] *Bull. Acad. Méd. Paris*, 1938, **119**, 697.
[8] Report III, on the Care and Treatment of Lunatics in the British West African Colonies. Nigeria. By Dr. R. Cunyngham Brown, C.B.E. To be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W.1. (5s.)

A NEW ANTI-MALARIAL DRUG

A new compound, "certuna," a dialkylamino-oxyquinolylaminobutane, has recently been reported by Kikuth[1] as having strong gametocidal action comparable to that of plasmoquine. The malarial parasite has such a complex developmental cycle that it is not entirely surprising that anti-malarial drugs do not have a consistent action on all stages of the parasite. Quinine and atebrin exert a powerful effect upon the asexual forms found in man and dramatically control the clinical manifestations of malaria, but plasmoquine is practically useless for this purpose. Plasmoquine, however, appears to have a devitalizing effect on the infection in that it lessens the frequency of relapse, and it also has a specially selective action on gametocytes; its use is not without interest, therefore, both to the clinician and to the hygienist. Unfortunately it sometimes gives rise to toxic manifestations even in moderate dosage, and it is on account of this toxicity that its value as a prophylactic, since it is also lethal to sporozoites, is in practice nullified. Clinical trials of the new compound "certuna" by Sioli[2] and others suggest that the new drug is much better tolerated by man than is plasmoquine, and further observations, particularly with regard to its influence on relapses or to its use as a prophylactic, will be awaited with interest.

[1] *Klin. Wschr.*, 1938, **17**, 524.
[2] Ibid., 527.

In view of the widespread disquiet among members of the medical profession as to the incompleteness of the plans for the organization of medical services and their lack of co-ordination, the Central Emergency Committee of the British Medical Association has asked the Minister for the Co-ordination of Defence to receive a deputation. Sir Thomas Inskip has agreed to receive this deputation on November 8.

The British Postgraduate Medical School announces that the Kettle Memorial Lecture will be delivered at the London School of Hygiene and Tropical Medicine, Keppel Street, W., on Thursday, November 24, at 5 p.m. The lecturer is Professor W. W. C. Topley, F.R.S., and he will speak on "The Place of Pathology among the Medical Sciences."

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

SULPHONAMIDE CHEMOTHERAPY IN SURGICAL INFECTIONS—II

BY

A. J. COKKINIS, M.B., B.S., F.R.C.S.

Gonococcal Infection

The gonococcus has always been a difficult organism to eradicate, and although it can be got rid of by sulphonamide therapy in a small fraction of the time taken by other treatments, this is by no means easy. Nevertheless, in a series of more than 600 cases, Dr. McElligott and I have shown that a male patient with gonorrhoea (whether simple or complicated) treated with sulphanilamide can be given a 90 per cent. chance of complete cure in a few weeks if the following principles are faithfully observed: (*a*) Chemotherapy must not be started until the discharge is at least eight to ten days old (it takes that much time for immunity to develop). (*b*) It should be preceded and combined with vaccine treatment (with the object of increasing this immunity). (*c*) It should be continued for three weeks, and the dosage must be adequate (for example, 4 grammes of sulphanilamide daily for an adult male of 11 or 12 stone). (*d*) Administration must be properly spaced (preferably four doses each day) and absolutely uninterrupted. (*e*) Relapses should be treated with a second course after an interval of some weeks. (*f*) The most rigorous tests and three months' observation must be passed before a patient is pronounced cured. Treatment with small doses (such as one tablet three times a day) over short periods is worse than useless; this and other errors of technique may lead to obstinate resistance to subsequent chemotherapy. Owing to the large total dosage required special care must be observed against the more serious toxic properties of the drugs. Minor toxic effects are naturally very common with this dosage, and may constitute an obstacle to effective administration, particularly in female patients.

The above summary applies to sulphanilamide only. In its place we are now using T 693, which promises to produce at least equally good results, but unfortunately without any diminution of the incidence of toxic effects. The only other sulphonamide with a definite action on gonococcal infections is uleron, which we have tried in some 150 cases. The immediate results are often excellent; but whatever method of administration is employed most cases relapse, and continue to do so until a more powerful sulphonamide compound is used.

Coliform Infections

Sulphonamide chemotherapy produces its best results in cases of "primary" urinary infections with *B. coli* and certain other organisms of the coliform group. These are cases of pyelitis, cystitis, or genital infections without an obvious gross cause (for example, a senile prostatic enlargement). Quite small doses and a short period (such as 2 grammes of sulphanilamide daily for six to eight days) suffice to clear up, both clinically and bacteriologically, most cases of "primary" pyelitis or pyelitis of pregnancy. I have noted, however, a tendency to relapse, and in consequence it is now my practice in non-urgent cases to give an autogenous vaccine (three or four times weekly) for one to four weeks before starting sulphonamide treatment, and to increase the period of chemotherapy to ten to fourteen days; also to give further courses if the pyuria recurs.

Cases of "secondary" urinary infection (such as those complicating an enlarged prostate or a calculus) are much more difficult to cure permanently, but a "cure" is less important than in the former group. The principal treatment here must be directed to the primary cause, whatever this may be, and the chief object of the chemotherapy is a temporary clearing up of the urinary infection as an adjunct to operation. This is most effectively obtained with sulphanilamide or T 693, but patients with this type of urinary infection may be too debilitated to tolerate these toxic drugs easily, and I have often preferred the less complete urinary disinfection obtained with a short four-day or five-day course of uleron (3 grammes daily) or prontosil soluble (10 to 20 c.cm. of 5 per cent. daily). This course should be given during the pre-operative stage of a prostate case, and may be repeated after prostatectomy to deal with the common post-operative exacerbation of the urinary sepsis.

Acute Appendicitis

The repeated discovery of coliform bacilli and non-haemolytic streptococci in acute appendices and in the peritoneal exudate induced me to explore the possibilities of sulphonamide chemotherapy in this disease, and there is now no doubt in my own mind that an indiscriminate use of these compounds in acute appendicitis—and in other urgent abdominal conditions—can be dangerous. An experience of more than forty cases treated in the past nine months, many of them bacteriologically controlled, has led to the following conclusions: (*a*) Sulphonamide therapy should not be used in the first forty-eight hours of an acute attack of appendicitis, either as an alternative to operation or as an adjunct to it. The only rational treatment for such cases is, and I think always will be, removal of the appendix. Chemotherapy at this stage is definitely unwise, as it may mask a dangerous complication or perhaps interfere with the first stages of the immunity response. (*b*) On the other hand, I have found sulphonamide compounds to be of real value as an adjunct to operation in the more advanced stage, when the appendix is perforated or necrosed, there is a purulent effusion in the peritoneal cavity, and the immunity response is presumably awakened. In such cases post-operative chemotherapy often rapidly clears up the peritoneal infection, and thus may prevent a prolonged illness, with wound sepsis and more dangerous complications. (*c*) The most striking results, however, have been obtained in late acute appendicitis with localized lump formation (plastic peritonitis without obvious abscess development). For some years it has been customary to treat these cases by expectant methods, which aim at complete resolution of the inflammatory process before appendicectomy is performed. Unfortunately, this expectant treatment may take several weeks before its object is attained, and sometimes it fails to prevent the development of an abscess, ileus, or other complications. This is the type of case in which sulphonamide chemotherapy seems most successful. Not only does the lump completely resolve and the patient become well often in a few days (without starvation), but abscess

formation and other complications are obviated, and appendicectomy may be safely performed after only a small fraction of the time one had to wait in pre-sulphonamide days.

The compounds mostly used in such cases have been prontosil soluble (10 to 30 c.cm. of 5 per cent. solution daily) and sulphanilamide (2 to 4 grammes daily). The former is particularly suitable for the first few days after an operation, when sulphanilamide often causes very troublesome toxic effects, such as vomiting, prostration, and cyanosis. Best results have been obtained when the chemotherapy is continued for about ten days.

Appendix and Other Abdominal Abscesses

Cases of definite appendix abscess have responded to sulphanilamide at least as well as those with a lump but without evidence of suppuration. Of eight such abscesses treated, every one resolved completely in five to fourteen days, while constitutional symptoms cleared up in twenty-four to seventy-two hours. None had to be drained, and only one developed a relapse (after two months), which was treated by early appendicectomy. The dosage of sulphanilamide has been between 2 and 4 grammes daily, and the period of administration has varied between six and fifteen days.

I have also obtained complete resolution of a large and increasing subphrenic abscess (of appendicular origin) in a desperately ill patient, with ten days' sulphanilamide treatment. The clinical improvement was immediate, while the rapid diminution of the abscess was easily followed by radiography.

Acute Cholecystitis and Cholangitis

The usual causative organisms are again coliform bacilli and streptococci, and the lesions might therefore be expected to respond to chemotherapy. A trial of sulphonamide compounds in six cases of acute cholecystitis and two of acute cholangitis has indeed shown that recovery from the acute illness is very materially hastened by the chemotherapy (Fig. 1). Unfortunately, four of the cholecystitis cases, all with gall-stones, afterwards relapsed and were treated by cholecystectomy. One may conclude that in such cases the chemotherapy is likely to be of only secondary or palliative value.

Acute General Peritonitis

My experience with sulphonamide compounds in acute peritonitis suggests that, when used correctly, chemotherapy may prove of life-saving value, but also that when used indiscriminately it may prove the reverse. The deciding factor again appears to be the immunity response of the patient. Although the cases treated have been comparatively few, they show quite decisively that sulphonamide compounds should not be used as a prophylactic measure against peritonitis in such lesions as perforated ulcer and intestinal strangulation, or after such operations as colectomy. They also suggest that it is unsafe to employ chemotherapy in the very early stage of actual peritonitis—that is, while the effusion is still serous and the immunity presumably unawakened. On the other hand, when the more powerful sulphonamide compounds have been administered to cases of fully developed coliform or streptococcal peritonitis, with either a profuse purulent effusion or an extensive peritoneal oedema, the result has usually been a dramatic and lasting improvement (Fig. 2). Once started, the chemotherapy should be continued in adequate dosage for at least ten days, but it should never be begun until after any removable and unlocalized source of infection has been dealt with by operation.

Infections of the Hand

No condition gives more striking evidence of the bacterial selectivity of sulphonamide compounds. In a fairly large number of septic hands treated no case of pure staphylococcal whitlow has responded. On the other hand, infections from which streptococci had been isolated on the whole responded very well. It is therefore necessary to make a bacterial diagnosis—for example, by aspiration—before chemotherapy is commenced. Streptococcal infections tend to spread along the superficial and deep

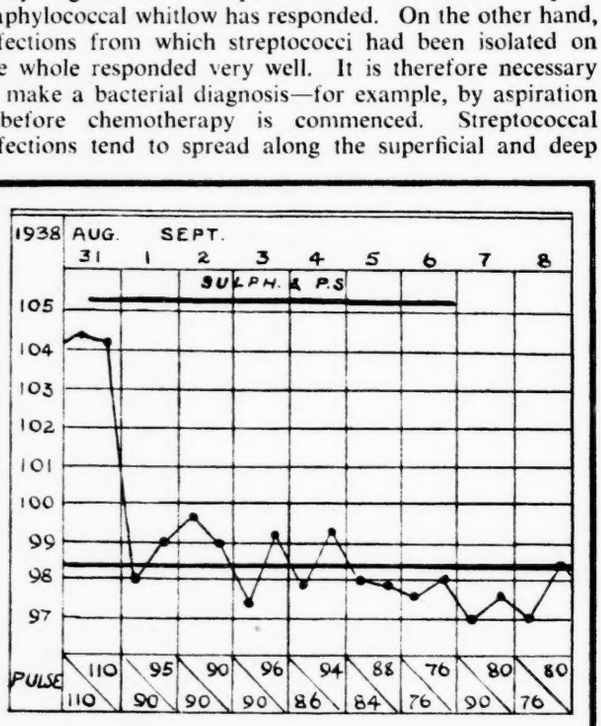


Fig. 1.—Temperature chart of case of acute cholangitis, treated with sulphanilamide and prontosil soluble.

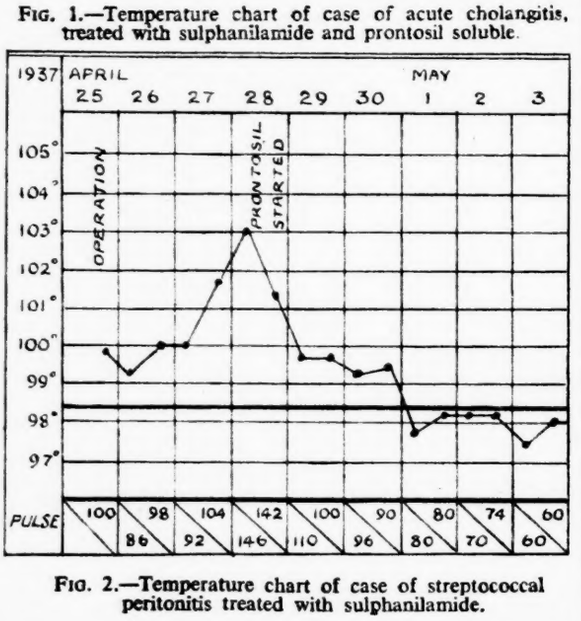


Fig. 2.—Temperature chart of case of streptococcal peritonitis treated with sulphanilamide.

lymphatics, and nearly all the successful cases have been infections of the great spaces of the hand or examples of acute lymphangitis. Tendon sheath infections are mostly staphylococcal, and of six such cases treated with sulphanilamide the only one which showed any improvement was a mixed infection of staphylococci, streptococci, and, strangely enough, *Cl. welchii*. The staphylococcal cases proved equally resistant to uleron.

Owing to the speed with which streptococcal infections of the hand spread, it is unwise in these cases to wait for immunity, and chemotherapy should be started as soon

as bacterial diagnosis is made. Whenever possible, however, this should be combined with some form of rapid immunotherapy, such as by anti-streptococcal serum. The dosage of sulphanilamide used has been 2 to 4 grammes daily for five to twelve days. In no case should the chemotherapy be employed as an alternative to surgical drainage if there is the least indication for the latter. The only exceptions to this rule are cases of streptococcal lymphangitis, where the primary focus of infection is often insignificant (for example, a puncture of the finger at a septic operation) and where the real danger is a septicaemia. I have seen two such cases, both caused by a haemolytic streptococcus and both already with evidence of blood infection, respond with dramatic suddenness to sulphanilamide. This experience justifies the hope that the new chemotherapy may afford some protection against a danger to which our work exposes us, and by which many a brilliant career has in the past been brought to an abrupt end.

Infections of the Skin and Subcutaneous Tissues

Here again the results of chemotherapy depend entirely on the nature of the infecting organism. Thus, in several cases of carbuncle (staphylococcal) treated with sulphanilamide or uleron there has been no response. On the other hand, very marked improvement has been observed in cases of streptococcal cellulitis, and, of course, in erysipelas.

Infection of Bones and Joints

Osteomyelitis is predominantly a staphylococcal disease, and, as might be expected, sulphonamide chemotherapy produces little or no results in it. Actually, some slight benefit was noted in three cases, one of acute and two of chronic osteomyelitis, but it proved very transient.

Infective Arthritis, on the other hand, is often caused by sulphonamide-susceptible bacteria, and I have obtained striking results with sulphanilamide in both gonococcal and streptococcal cases. Now, with the introduction of T 693, one may reasonably expect to be able to influence pneumococcal arthritis also.

Toxic Arthritis (for example, rheumatoid) belongs to a very different category, and is a condition in which useful research could be done in general practice. I know of several cases treated with repeated courses of sulphanilamide, preceded by and combined with vaccine, in which improvement has been obtained. If possible, autogenous vaccine should be used, but a stock anti-rheumatic vaccine may be employed when there is no obvious focus of infection. Improvement is most likely in the relatively acute cases of rheumatoid arthritis seen mostly in youngish people, and I recommend small doses of sulphanilamide (1.5 to 3 grammes daily) in three or more 14 to 21-day courses, with three to four weeks' intervals, a full course of vaccine being given as well.

Traumatic Surgery

In this branch of surgery my experience with sulphonamide chemotherapy has been rather disappointing. For some time it was hoped that it might be of service in the prevention of wound sepsis (for example, in traffic accidents), but I am now very doubtful if such prophylactic use is of any value. On the contrary, there is reason to believe that it may do harm. It is quite rational, however, to treat an infected compound injury with sulphonamide, if the infection is already established, and provided at least one of the organisms present is known to be susceptible. Striking improvement has been seen in several such cases, particularly when the suppuration has been mostly in the superficial tissues, and also in one case of clinical gas-gangrene, in which the diagnosis was unfortunately not confirmed bacteriologically.

Conclusion

The more one learns of the new chemotherapy the more one feels that it should be employed only when an infection has become fully established, and, as a general rule, the longer the infection has been in existence the better the results are likely to be. Occasional exceptions are bound to occur, such as when a fulminating infection threatens to overwhelm the patient, and when an attempt to arrest bacterial growth must be made without waiting for the immunity response, which may or may not develop. There is one application of sulphonamide chemotherapy, however, which in my experience has proved quite valueless (and even dangerous), and that is its preventive use against the threat of an impending infection.

PROPHYLAXIS OF THE COMMON COLD

BY

J. B. SHERMAN, M.B., B.S.

Medical Officer, Bournville Works

There are few, if any, medical conditions which cause such severe economic losses to employer and employee as the common cold. The great number of so-called treatments and prophylactics bears testimony to our failure to cope with the problem. One of the difficulties facing the general practitioner is that of being able to treat under strict control large numbers of patients, this being the best method of estimating the value of any form of treatment. In the present state of our knowledge it would seem that methods of prophylaxis offer more hope of success than those of treatment.

In view of the opportunity afforded at these works it was decided to try the effects of some of the better-known prophylactics upon a rather larger scale than usual, and by keeping strict records to obtain some idea as to their comparative values.

The Methods Used

Four methods were chosen as all holding out reasonable prospects of success.

1. *Ultra-violet Irradiation.*—The good effects of this as a preventive of respiratory infections have often been quoted. The apparatus used here was a pair of Watson carbon arc lamps. Exposures were given at a distance of three feet twice a week, working up to a total exposure of fourteen minutes. This was carried on throughout the winter months. No ill effects were noticed.

2. *Vitamins A and D.*—Vitamin A, 6,000 units, and vitamin D, 1,000 units, were given in the form of one capsule (adexolin) a day after a meal. A course lasted throughout the winter. A certain number of patients suffered from nausea and other gastric discomfort, but otherwise no ill effects were noticed.

3. *Dissolved Vaccine.*—As supplied by Glaxo Laboratories this consists of a mixed vaccine of organisms found in the upper respiratory passages. The cell walls of the organisms are dissolved by sodium lauryl sulphate. Four injections were given subcutaneously at five-day intervals, starting with ½ c.cm. and increasing to 1 c.cm. for the three subsequent doses. The immunity conferred was intended to last the whole winter. In patients who already had colds it was found to make them worse. The injections often caused stiffness and pain in the arm, but in only one case was real disability noted.

4. *Entoral Vaccine.*—These were mixed vaccines in a dried form in capsules for oral administration. They were given on an empty stomach—one a day for the first week and then one a week for the whole winter. Apart from causing discomfort to patients who already had colds and causing nausea in others, no other ill effects were noticed. In numbers of patients treated by methods 3 and 4 there seemed to be an increased susceptibility to colds.

5. *Control Group.*—This consisted of 593 patients who received no prophylactic treatment but of course were free to treat any colds they had by ordinary means. Records were kept of all patients and controls by personal cards filled up week by week and collected monthly, so that as far as possible the information was accurate.

Results

The results were tabulated to give an idea of the value of prophylaxis as a whole and of the comparative values of the various methods. Altogether 1,928 patients were observed, of whom 1,655 completed the course. Of this number 593 were controls, so that full results of treatment were obtained of 1,062 patients.

There were two possible effects to be expected from treatment—either a reduction in the number of colds contracted, or a reduction in the severity of colds. Either or both results would affect the loss in working days per employee. As the treatments were purely voluntary it was expected that those who had suffered mostly in previous years would form the majority of those seeking treatment, and this would make results seem less good than otherwise.

It was found, however, from our records that the number of working days lost through colds per employee for the winter of 1936–7 was 2.12 for the control group and 2.24 for the group receiving treatment. It was not, therefore, considered necessary to make any correction for this factor.

1. *Number of Colds.*—As seen in the table the only treatment to produce any reduction in the number of colds per person was ultra-violet irradiation, and this shows a substantial decrease.

2. *Severity of Colds.*—There has been no reduction in the average duration of colds. The number of working days lost per cold does, however, show a definite decrease as a result of all treatments except entoral vaccine. There would therefore appear to be a lessening of severity of colds, if one accepts days lost as an index of severity, and this seems reasonable. Taking the results as a whole, the number of working days lost per person has been substantially reduced by ultra-violet irradiation and slightly reduced by the vitamin treatment.

Comments

It is usually accepted that the good effects of ultra-violet irradiation are due to the formation of vitamin D in the skin. It is of interest to note the distinctly better results from the irradiation as compared with those from the oral administration of vitamin D. The question arises as to whether ultra-violet light acts also in some other way or whether vitamin D given orally is less effective than when formed naturally in the skin.

While the figures given for treatment by dissolved vaccine are not startling, it was found that a large percentage of patients so treated obtained complete relief from colds, although they had suffered during previous winters. Several reports were received of mild chronic catarrhal conditions completely clearing up. Five patients who complained of mild joint pains volunteered their delight at the disappearance of these. The two latter facts may prove of value in some cases from the point of view of treatment.

It was decided, in the case of entoral vaccine treatment, to give only one capsule a week on the score of expense. Our results with this method might have proved better had we given bigger doses, although a large number appeared to be worse on the given dose. If prophylactic treatment is to be offered to some thousands of employees, as we hope to do, then expense is a definite factor with which to reckon. One might stress the difficulty of making patients take regular daily or weekly treatment over some months.

Summary

An attempt has been made by a large industrial concern to estimate the value of some current methods of cold prophylaxis: 1,655 employees were observed, including controls.

It was found that the only method of real value was ultra-violet irradiation, which reduced both the severity and the number of colds in patients so treated. The method is cheap and easily applicable to large numbers of employees. Its use by big industrial concerns would definitely lower the tremendous economic losses at present caused by the common cold.

Table showing Results of Treatment for Colds (December, 1937, to March, 1938) (Males and Females)

Type of Treatment given	No. of Persons	No. of Colds	No. of Colds per Person	Average Duration of Cold (Days)	Working Days lost per Cold	Working Days lost per Person	
						1938	1937
Controls ..	593	875	1.48	6.65	0.72	1.06	2.12
All treatments ..	1,062	1,646	1.55	7.09	0.65	1.01	2.24*
Entoral ..	283	427	1.51	6.87	0.79	1.19	
Adexolin ..	330	569	1.72	7.09	0.59	1.01	
Dissolved vaccine ..	213	402	1.89	7.53	0.61	1.15	
Ultra-violet ray ..	236	248	1.05	6.76	0.63	0.67	

* Not treated in 1936-7.

I wish to express my gratitude to Messrs. Cadbury Bros. Ltd., whose generosity made this investigation possible, and to Miss Tattersall and Miss Maton for valuable assistance with the records and statistics.

FORLANINI INSTITUTE: SCHOLARSHIP

The Privy Council announces that in connexion with the Carlo Forlanini Health Institute of Rome, a clinic for diseases of the respiratory system and tuberculosis, which organizes annually (from January to April) courses of training in phthisiology for foreign medical practitioners, the National Fascist Institute for Social Welfare offers to British medical practitioners:

1. A scholarship consisting of exemption from fees for registration and attendance at the course, free board and lodging at the Institute, and other facilities, including special railway facilities.

2. Three nominations entitling the holders to exemption from fees for registration and attendance at the training course, and other facilities, including special railway facilities.

Candidates must be qualified medical practitioners of at least three years' standing who have rendered effective service in specialized medical clinics or sanatoria or other scientific institutions for the treatment of tuberculosis. Any publications and attendance at other courses specializing in phthisiology can be considered as claims for preference.

With the concurrence of the Privy Council the British Medical Association has undertaken to receive applications from medical practitioners, who should communicate with the Secretary of the Association at B.M.A. House, Tavistock Square, London, W.C.1, not later than November 1, 1938, giving details of age, qualifications, and experience.

OPENING OF THE NEW SESSION

WELSH NATIONAL SCHOOL OF MEDICINE

GENERAL MacARTHUR ON THE WISDOM OF THE OLD LEARNING

The opening sessional address at the Welsh National School of Medicine, Cardiff, was given on October 7 by Lieutenant-General W. P. MacArthur, Director-General, Army Medical Services, the text of whose remarks was Chaucer's line:

> "And out of oldë bokes, in good feith,
> Cometh al this newë science that men lere."

His object, he said, was twofold: first to try to show how much could be learned in medicine by simple observation, and also that, as Horace expressed it, there were heroes who lived before Agamemnon. Owing to his heavily increased duties in the international crisis he had taken much of his material from previously published papers of his.

General MacArthur began by glancing at the medicine of the early Christian era. In Europe the advance of medicine along scientific lines came to an end with the eclipse of Greek medical learning about A.D. 200, but the light, though much dimmed, continued to burn in the Moslem Empire, with its capital at Bagdad, where they possessed Arabic translations of the ancient Greek experimentalists and added to the sum of knowledge by observations of their own. Rhazes (born A.D. 860) differentiated measles from small-pox, and part of his description was judged by Osler good enough for inclusion in his textbook.

Early Observations on Typhus Fever

After describing with many vivid touches the reaction in Western Europe to the universal epidemic of plague, called to-day the Black Death, General MacArthur discussed another disease which our ancestors had every opportunity of studying—namely, typhus fever, otherwise spotted fever, famine fever, jail fever, camp fever, and, most ominously, hospital fever (the name "typhus" was given to it only in the middle of the eighteenth century). The terrible epidemic transmitted by the louse scourged these islands for centuries, always smouldering somewhere, and ready to flame up in times of war and famine.

On reading old accounts of typhus fever one could not but be struck by the wide clinical knowledge of the disease shown. These old observers knew that the rash might appear on the fourth day or not until the fourteenth, or might not be seen until after death; they were aware that some cases of typhus have no rash at all. It was pointed out a few years ago that in cases of typhus without an eruption a ligature tied around the arm might dilate the damaged vessel sufficiently to produce petechiae distal to the ligature, but this effect of a ligature was known centuries ago. Boghurst, writing of the London plague in 1665, gave a careful differential diagnosis of typhus and plague with tokens. These old writers recognized, further, an atypical variety of typhus fever like Brill's disease, very difficult to diagnose because of its mildness; and they observed that when such cases were crowded together the disease, through what they called the concentration of contagion, assumed its malignant petechial character and grew very mortal. The complications were clearly set out: the deafness; the eye lesions, including the late cataracts; suppuration of the parotid and submaxillary glands; orchitis; adenitis; late oedema; gangrene of the skin, of the extremities, of the intestine; even the rare patches of softening in the brain followed by paralyses, and the rare orbital abscesses. Indeed, the speaker doubted whether there was a single complication given in Daniélopolū's great monograph on typhus which was not already recorded by these old writers.

The Spread of Infection

The observations of these men of a former age on the dissemination of the disease were amazingly accurate. They knew that it was spread by actual contact with the sick, and by clothing, bedding, and so forth contaminated by them, and that naked persons were less dangerous than those who wore clothing. Army physicians of the Dettingen and Fontenoy period were warned not to come into actual contact with typhus cases, but to stand at a little distance, and in examining the pulse to step forward, carefully pick up the patient's wrist, and as soon as possible step back again. They knew that typhus patients thoroughly cleansed and given fresh straw could be nursed among others without danger of contagion, and that if such measures could be instituted and maintained typhus fever would not break out. Even the role of lice as vectors of typhus was considered, and Lind (1716–94), in advocating sulphur as an efficient fumigant for typhus-infected clothing, pointed out that sulphur did not destroy lice, "from which we might be led to imagine that contagion is not propagated by animalcules." In Lind's experience, presumably, the sulphur destroyed the active forms of the lice and put an end to the disease; the more resistant eggs hatched out later, and so the clothing, although disinfected, was certainly not freed from lice.

The recommendations of Lind (who was physician to the Naval Hospital at Haslar during the third quarter of the eighteenth century) to eradicate typhus from the Navy could hardly be bettered to-day. He advocated the provision of depot ships where all men drafted to the Navy would be detained, thoroughly cleansed, and given fresh outfits. Their own clothing, if worth preserving, should be fumigated in a special smoke-room or heated in an oven; no infection, he said, could resist the heat of an oven. The men should be detained in the depot ships until the incubation period of typhus had passed—lest they should have been infected before joining the Navy—and then drafted to their ships. If Lind's counsel had been followed the Navy would have escaped the appalling epidemics of ship fever during the successive French wars, when the fleets used to go into port and land so many thousands of cases of typhus that one wondered that men enough were found to man the fleet. But Lind's voice was but a crying in the wilderness, and typhus persisted in the Navy for another half-century, in conditions summarized by Smollett, himself a naval surgeon, when he wrote that it was surprising not that the sick should die but that any should recover.

Moderns Anticipated

When these old writers forsook the guidance of observed facts for the distractions of their imagination, and entered the world of theory, they soared to transcendental heights of absurdity, but this ought not to lead us lightly to reject something which they said they had observed merely because it ran contrary to what was taught to-day. Some of their statements became intelligible to us only when our own knowledge advanced by another stage. For example, when malaria was introduced as a cure for general paralysis it was found that in the majority of patients infected by a single bite of a single mosquito the disease ran a continued course to begin with, and that the regular and disciplined attacks only occurred later. But in the reign of Charles II Sydenham wrote of intermittent fevers, as he called malaria, that they—

> "do not perfectly put on their shapes, for they imitate continued fevers so well that it is hard to distinguish them. But the violence of the constitution being a little quelled, and its strength checked, having thrown off the mask they then openly appear to be intermittents, either tertians or quartans, as indeed they were really at first. And if this be not carefully

observed, we shall be deceived in our prescriptions, much to the prejudice of our patients, while we mistake fevers of this kind, which are of the order of the intermittents, for true and genuine continued fevers."

Bacot, some time before his tragic death from typhus contracted in the course of his experiments, pointed out that he had succeeded in infecting the fleas of common hens with plague, and he made the suggestion that the occurrence of the disease amongst such birds would be a great danger because of their close association with man. This brought to mind a puzzling sentence in a book entitled *Ane Breve Description of the Pest*, by Gilbert Skene, professor of medicine in Aberdeen and physician to James VI of Scotland. He wrote that this "infectioun bringis baith man and beast to death . . . and speciallie quhan the Domesticall foulis becummis pestilentiale it is ane signe of maist dangerous pest to follow."

Sometimes, however, these old observers discarded some theory which we now knew to have been correct because their experiments appeared to disprove it. During the London plague of 1665 a considerable body of opinion held that this disease was not due to a fermentation but to a living organism—"animated Matter," as they called it—which entered the body and threw off a poison there. Nathaniel Hodges carried out an investigation to try to determine the presence of this "animated Matter," but the only evidence he could find to support this theory was an account of one plague patient "who in vomiting threw up a strange figured Insect, which appeared very fierce, and even assaulted such as were busie to observe it, whereupon it was crushed by a rude Hand, so that its shape is not very discernible!"

FRACTURE CLINIC FOR SEAMEN

THE NEW ALBERT DOCK HOSPITAL

The new Albert Dock Hospital at Plaistow—one of the six for which the Seamen's Hospital Society is responsible—was opened by Queen Mary on October 21. It replaces the old building, near the same site, which was condemned as unsafe owing to soil subsidence. In its forty-seven years of existence the old hospital treated more than 375,000 patients from all parts of the world. Apart from its casualty and general hospital work, it was famous as the "workshop" of Sir Patrick Manson, a portrait of whom is in the entrance hall of the new building. Queen Mary during her visit was presented with a paper-cutter fashioned from the teak laboratory bench which Manson used. The new hospital, a pleasant, unpretentious building, has fifty-five beds, and has cost approximately £85,000. Relatively small as it is, it makes an effective contribution to modern hospital architecture.

Its outstanding feature is the fracture clinic. Owing to the number of accidents in dockland, at the gates of which the hospital stands, it was resolved to establish here a fracture clinic and rehabilitation centre as complete and well thought out as orthopaedic science can suggest. Three years ago, when the report of the special B.M.A. Committee on Fractures was published, the medical and surgical staffs of the six hospitals of the Society met and resolved that fracture cases should be concentrated at the Albert Dock Hospital, and that in their treatment the four conditions laid down in that report should be observed—namely, segregation of cases, continuity of treatment, unity of control, and after-care. The unit now installed claims to be the most complete in existence—complete in the sense that the injured man is cared for from the moment he meets with his accident until he is fit to return to his full pre-accident employment. It takes into account, for example, his nutrition. Patients discharged from the wards and continuing to attend the out-patient department and gymnasium receive their meals at the hospital, because it is recognized that one of the most frequent causes of delayed union and continuing incapacity is under-nourishment. In order to study modern methods in fracture treatment Mr. H. E. Griffiths, surgeon to the hospital, has visited a number of American centres, including Sherman's clinic in Pittsburgh and Darrach's in New York, also Böhler's clinic in Vienna with others in Europe, not with the idea of slavishly copying anything but of ensuring that no modern method or equipment which seemed promising was disregarded.

Avoidance of Shock

The clinic at Plaistow is full of surprises. They begin, indeed, with the arrival of the ambulance, which is a specially constructed vehicle, always kept heated, and with stretchers which can be taken in and out without jerking. The ambulance actually comes into a heated bay of the hospital, adjoining which is a room equipped like a small theatre, where the patient is immediately placed in a radiant heat bath and given saline or blood transfusion as necessary. Thus within five minutes of the arrival of the ambulance all the measures required to prevent shock have been mobilized for the benefit of the patient. From the "shock room" in due course—it may be after several hours, in accordance with the needs of the case—the patient is transferred to the operating theatre or the ward. The operating block consists of two large theatres, and the feature of both of them is the *x*-ray apparatus adjacent to the table and the dark-room actually built into the theatre. An exposure is made during the operation, and after a matter of seconds—the actual time at the demonstration was eighty-five seconds—the large developed negative is placed in the illuminated panel of the dark-room door in the surgeon's field of view. Sometimes as many as four such exposures may be made during an operation. One feature of the theatre is a Zimmer distractor for bringing into apposition the ends of broken bones.

In the wards the beds are arranged in four pairs and four groups of four. Each bed can be shut off as a complete cubicle if necessary, and each is equipped with pulleys and facilities for every kind of movement. Adjacent to the ward is a dressing-room equipped like a small theatre to which a patient can be taken for privacy during any special dressing. The wards look out on to large sun and rest rooms, and a roof garden on to which beds can be wheeled.

The Rehabilitation Centre

The Nuffield gymnasium or rehabilitation centre, at the time of our visit, was fully occupied with men recovering from fractures, who were engaged in various forms of recreation. These men—out-patients—are invited to remain for the full working day of eight hours, which is spent largely in competitive games. A form of rowing machine has been found useful, also fixed bicycles, ladders, and the like. For five minutes at the end of each half-hour they are called into line and carry out deep-breathing exercises. Mr. Griffiths does not favour occupational therapy in this field. There is a danger, he thinks, that a man with an injured limb, if set to use that limb in avowedly occupational movements, may have his disability emphasized in his mind, whereas if he carries out substantially the same movements in recreation he loses not only the muscular stiffness but also the mental preoccupation.

Other departments at the hospital include those for electrotherapeutics and massage. Two important non-medical members of the staff are the trainer in the gymnasium, who is a well-known former trainer of a football team and a man of inspiring personality, and the technician in charge of all the splints, apparatus, and plaster used in the hospital. The latter has visited Vienna to study the methods used by his opposite number in Dr. Böhler's clinic.

Reports of Societies

SULPHANILAMIDE: ITS USE AND MISUSE

At the meeting of the Medical Society of London on October 24, with Dr. C. E. Lakin in the chair, the subject for discussion was sulphanilamide, its use and misuse.

Sir William Willcox said that the discovery that sulphanilamide and its derivatives had a specific antibacterial action on haemolytic streptococci was one of the greatest chemotherapeutic advances of recent years, ranking in importance with the discovery by Ehrlich of the action of salvarsan on the *Spirochaeta pallida*. In both these cases the chemotherapeutic substance did not display its full antibacterial action when acting *in vitro*; it was the combination of the drug with blood that enabled the full bactericidal effect to be manifested. The antibacterial effect of sulphanilamide was shown to the fullest extent when, in addition to an adequate blood content of the drug (1 in 10,000 to 1 in 20,000), there were also present in the blood immune substances, whether produced by active or passive immunity.

The number of derivatives of sulphanilamide on the market was considerable. He showed a list of thirteen sulphonamide preparations at present in use under different trade names. The latest was M. and B. 693 or T. 693. Sulphanilamide was of great value in all acute infections due to haemolytic streptococci. The course of scarlet fever at present was so mild that drugs were not required in the majority of cases, but in the more severe type, with complications, the sulphanilamide drugs were most valuable. Cases of erysipelas responded rapidly. Meningococcus infections cleared up in a remarkable way under treatment with sulphanilamide, and the beneficial therapeutic value of the drugs in gonococcal infection was well established. In urinary infections pyelitis and cystitis due to *B. coli* responded, but it was doubtful if sulphanilamide should usually be the primary method of attack, as the toxicity of the preparation was greater than that of mandelic acid, which latter appeared to be the more efficient antiseptic. He also referred to recent work suggesting that T. 693 (the pyridine derivative) had a definite antibacterial effect on pneumococci, especially on Types 1, 7, and 8; this effect was enhanced by the presence of immune bodies from a suitable antiserum.

Misuse of Sulphanilamide

Toxic symptoms of a mild type, Sir William Willcox continued, were extremely common when full doses of these drugs were being taken; they occurred in 50 per cent. or more of cases. The employment of sulphanilamide compounds should be reserved for cases in which the infection was due to a haemolytic streptococcus or some organism known to be vulnerable to the drug. The mere presence of a few haemolytic streptococci in the stools or nasopharynx was not an indication for their use unless there was clinical evidence that these organisms were causing the illness of the patient. Routine use in ordinary mild attacks of pyrexia, such as influenzal colds, was to be deprecated. It was important that drugs of the sulphanilamide group should be taken only under medical supervision, and therefore these drugs should be placed under the Fourth Schedule of the Poisons List, so that they could only be obtained by the prescription of a qualified medical practitioner.

Toxic symptoms of such gravity as to cause death were infrequent, but idiosyncrasy had always to be remembered and extreme watchfulness and care should be exercised. Repeated blood examinations, including red and white cell counts, should always be made if toxic symptoms occurred. Minor toxic phenomena were extremely common, and included general malaise, nausea, anorexia, and simple cyanosis without demonstrable haemoglobin changes; more severe was the cyanosis due to methaemoglobinaemia or sulphaemoglobinaemia. Drug fever might occur after several days' administration of full doses. Grave toxic phenomena included agranulocytosis, which might be accompanied by fever, marked exudative throat changes, severe anaemia with typical alterations in the white count and disappearance of the polynuclear leucocytes, and profound toxaemia. Acute haemolytic anaemia and severe hypochromic anaemia had been observed.

Where severe toxic phenomena appeared the drug should be at once discontinued and appropriate remedies, such as blood transfusion, employed. If the blood showed no abnormal changes and a serious bacterial infection was present administration might be continued with caution, in spite of mild toxic symptoms, the aim being to produce a blood content of sulphanilamide which would assist the natural blood defences to operate on the invading infection. In such cases when mild intolerance to the drug was shown an administration over a period not exceeding three or four days was advisable, and after discontinuance for a short period the administration might, if necessary, be resumed.

Antibacterial Action of the Drugs

Professor Alexander Fleming took his "text" from a recent annotation in the *British Medical Journal* (October 8, p. 752), which raised two problems of great interest in connexion with sulphanilamide. The first was the standardization of the methods for testing chemotherapeutic drugs, and the second, the association of chemotherapy with immunotherapy. The testing of a chemotherapeutic drug somewhat resembled the examinations for medical qualification: it included two preclinical and a final clinical examination. The first consisted of an examination of the power of the chemical to kill or interfere with the growth of a microbe in human blood. The easiest way to do this was by the "slide-cell" technique which had been used in the laboratory at St. Mary's for many years. By this method it could be shown that sulphanilamide in concentrations of 1 in 200 had the power to damage leucocytes, and in concentrations of 1 in 128,000 to inhibit streptococci. In this first examination it was clear that the sulphanilamide group passed with honours. The second examination consisted in injecting the chemical into the body of an animal and then testing the blood at intervals for any enhanced antibacterial power. If this were done with sulphanilamide or T. 693 the blood had an increased antibacterial power which was at its height immediately after injection, indicating that the drug had a direct action on the bacteria, because if it had to be altered in the body to some antibacterial substance the change would take time, as happened with the original prontosil. The final examination was the cure of infections of man and laboratory animals by means of the drug and examination of its toxicity to the organisms as a whole. This was a question for those with more clinical experience.

Turning to the other problem raised in the annotation mentioned—the combination of chemotherapy and immunotherapy—he spoke mainly of T. 693. According to his experiments this drug had a very powerful action in inhibiting the growth of the organisms, but its actual bactericidal action was comparatively slight. This meant that the actual killing of the organism had to be done by the natural defences of the body. He showed a chart illustrating the effect of T. 693 on pneumococci in human blood with and without immune serum. With blood plus saline there were innumerable colonies; with blood plus immune serum the colonies were reduced; with blood plus T. 693 in a concentration of 1 in 16,000 there were again innumerable colonies; with blood plus T. 693 in a concentration of 1 in 32,000 plus immune

serum there were no colonies, but when leucocytes were taken out of the blood innumerable colonies reappeared.

Treatment of Pneumonia

In the light of these results it was profitable to discuss from a theoretical standpoint the treatment of pneumonia. The best results seemed likely to be obtained by a combination of chemotherapy (T. 693) and immunotherapy by means of serum or vaccine. The annotation in the *British Medical Journal* suggested that serum therapy should be reserved for severe and desperate cases, but it seemed to him that he would be a bold physician who, on seeing for the first time a case of pneumonia in a middle-aged man, was certain that it would be a favourable case for the use of only one of two powerful remedies, especially when those remedies were complementary. The grounds for withholding serum therapy in cases other than severe and desperate were that it was "expensive, difficult to administer, and apt to cause unpleasant after-effects." There was another way to induce immunity against the pneumococcus to which none of these objections applied. Vaccine therapy was cheap, easy to administer, had no unpleasant after-effects, and was available for every type of the organism. It had been shown in laboratory animals and in man—even in patients suffering from pneumonia—that after a single injection of pneumococcus vaccine antibodies appeared in from twenty-four hours to four days.

Professor Fleming suggested that in pneumonia, if the pneumococcus was of a type for which there was an effective serum, the serum and T. 693 should be given immediately; but if serum was not available, or it was not desired to give it, then an appropriate vaccine should be given, followed later—perhaps after a couple of days—by T. 693. The latter was quickly absorbed, and if the patient seemed to be going downhill it could be given and the action would be obtained within a few hours. But ordinarily it seemed better to give the vaccine and wait until there was a reasonable chance of specific immune bodies being present, and then give the T. 693. There was another reason for the delay—namely, that there was some evidence that the organism established tolerance to the drug. Therefore it was well, if possible, to withhold it until the body had acquired some immunity to the infection.

Puerperal Sepsis

Dr. Eardley Holland discussed the work of Colebrook and his colleagues at Queen Charlotte's Hospital on the clinical value of the sulphanilamide group of drugs in the treatment of the haemolytic streptococcal infections of puerperal sepsis. He showed tables illustrating the striking improvement in mortality in 1936 and 1937, when these drugs were given, as compared with the five previous years. During 1930–5 there were 119 cases of septicaemia with or without peritonitis, with eighty-nine deaths, a mortality of 75 per cent. In 1936–7 there were thirty cases with eleven deaths, a mortality of 37 per cent. In regard to peritonitis alone in the former period there were ninety-eight cases with eighty-five deaths, and during the last two years five cases with three deaths. The drugs seemed to diminish the incidence of peritonitis as well as the mortality from it.

A number of people stated that the improvement in haemolytic infections since these drugs came into use was due to a diminution in virulence of the streptococci, and not to any effect of the drug. There was a certain amount of evidence that the organism was less virulent. Scarlet fever, for example, had become a much less serious disease than formerly. In the North-Western Fever Hospital, in which the L.C.C. cases of puerperal infection were segregated, some remarkable figures had been obtained for which he was indebted to Mr. James Wyatt. They showed the proportion of cases of septicaemia due to haemolytic streptococci.

	Cases of Septicaemia	Cases due to Haemolytic Streptococcus	Percentage
1932	18	14	77
1933	17	13	76
1934	13	9	69
1935	12	6	50
1936	13	6	46
1937	14	4	29

These figures might or might not give rise to the inference that the haemolytic streptococcus was becoming a less virulent organism, and it was a point for discussion whether the excellent results in puerperal infections with these drugs were due not only to the drugs but to a diminution in virulence of the organism.

Sulphanilamide in Gonorrhoea

Dr. G. L. M. McElligott mentioned experiences with the sulphanilamide compounds in the treatment of gonorrhoea at St. Mary's Hospital venereal diseases clinic. Over 1,000 cases had been treated with sulphanilamide and the analysis continued to show good results. They had treated 150 cases with uleron, with not such good results, and 200 cases with T. 693, which gave even better results than sulphanilamide, while proseptasine, used in a few cases, gave no lasting results at all. The treatment was divided into courses of from 70 to 80 grammes over a period of three weeks in adult males of average weight. The optimum dose appeared to be 4 grammes daily for ten to fourteen days, followed by 3 grammes daily for a further week. In the majority of cases one course sufficed to cure. Small doses appeared to be worse than useless, and seemed to make the patient abnormally resistant to further treatment even with large doses. The most important point elicited was that the correct time to start sulphanilamide was after the eighth day of the disease. A sudden improvement in the results of cases treated in the second week could only be explained by the fact that it took that length of time for the body to acquire enough immunity to deal with the organisms whose growth had been arrested by the sulphanilamide. Failures were due to premature chemotherapy, insufficient dosage and period of administration, and early interruption of the treatment. A fairly high proportion of toxic effects followed the use of the two most effective compounds, sulphanilamide and T. 693. Mild effects were shown in 50 per cent. of cases. These included slight headache and giddiness. Moderate effects—vomiting, diarrhoea, skin rashes, etc.—were seen in about 10 per cent. A few serious effects were noted, including an extensive purpuric rash.

General Discussion

Mr. William Ibbotson mentioned the value of anti-scarlet-fever serum given by rectum. He had treated about 100 cases with this serum in hospital. Although he had had encouraging results with the new compounds, the use of this serum, from his experience, ought not to be disregarded. Dr. P. H. Manson-Bahr said that in the United States, which he had lately visited, "everything is being cured with sulphanilamide and prontosil." Even the small clinics seemed to be continuously employed in estimating the amount of sulphanilamide in the blood of patients. Dr. G. W. Goodhart asked how often one should make blood examinations. As one responsible for pathological investigations, if he were to do all the things he was asked to do his entire staff would be employed on nothing but blood counts. Dr. Horace Evans raised the question whether a case of impending agranulocytosis was due to the drug or to the original disease. Dr. C. E. Lakin said that one very important thing about this drug was the new avenues—if that expression could be allowed—which it had opened up. Although it acted to prevent the growth of organisms and gave the body's resistance a chance to play an important part, it did not injure the tissues. He

believed that still greater achievements with drugs of this series might be expected.

Sir William Willcox replied to a question on the danger of intravenous injection. It was suggested by the makers that it was not safe to give the azo dyes intravenously, but this was largely a matter of technique, and in careful hands it might be safe.

MULTIPLE CAUSATION IN PSYCHIATRY

At the meeting of the Section of Psychiatry of the Royal Society of Medicine on October 11 Dr. H. Crichton-Miller, on taking the presidential office, delivered an address in which he pleaded for a consideration of multiple aetiology in psychiatry.

Dr. Crichton-Miller gave illustrations of the way in which a resultant factor, whether organic or psychic, might reinforce, or be reinforced by, a purposive or conative factor. He explained that by a resultant factor he meant any deviation from the normal which could reasonably be regarded as a manifestation of inherited characteristics or as the reaction of the organism to environmental influences, and by a purposive factor any symptom which might be taken as subserving an end, whether exhibitionism, evasion, defence, protest, or punishment. For example, the pupillary reflex was invariably resultant, but the blinking reflex might be either resultant or purposive (in other words, involuntary or voluntary), or a combination of the two.

Dr. Crichton-Miller worked out his theme by citing various syndromes in which both resultant and purposive factors appeared. For example, Freud had stated that his own slight attacks of migraine were wont to announce themselves hours before in the forgetting of names, and often at the height of the attack no proper names could be recalled. Here there were evidently two concurrent causal series: one psychic and the other organic; one a defensive adaptation, the purpose of which was to obviate affective pain, the other beginning with an unspecified psychological failure and resulting in migraine. According to Freud's statement, the intensification of the amnesia was a warning that an attack of migraine was impending; in other words, the organic sequence was reinforcing the psychic. The aetiology of migraine remained confused and obscure. In Dr. Crichton-Miller's view it could not be said with assurance that its origin was known and that that origin was purely organic in character. He left the example as a clear-cut presentation of synergy.

Psychic and Organic Factors

He next considered from the same point of view nocturnal enuresis. How far in this condition was it conceded that a purposive mechanism might coexist with a non-purposive? Might a small boy be suffering from threadworms and at the same time (according to the explanation of one school of analytical psychology which interpreted all enuresis in terms of regression to intra-uterine life) be expressing a longing to return to the uterus? In the same way, could an involutional melancholic be suffering from bacilluria and also be expressing a protest against the demands of modern life? To the speaker it seemed clear that the possibility, even the probability, of such cases of multiple aetiology must be admitted. In nocturnal enuresis there was a constant interplay between organic and psychic factors. The problem might also be studied in a case of nightmare. He found it impossible to regard nightmare as being merely stimulated by a morbid organic condition. He would rather say that most nightmares occurred as a result of somatic disturbance, while their content emerged from conative and affective patterns of the psyche. But the aetiology was left so vague as to invite a certain unwarranted assurance in the claims of the psycho-analysts.

Finally, he mentioned war neuroses. The war provided thousands of cases in which physical factors coexisted with fear resulting from war experience. He suggested that in some future war a medical officer giving a diagnosis of war neurosis would be asked to answer how far he supposed that a defence mechanism, conscious or unconscious, entered into the case, how far toxic factors were contributing, how far he considered the man constitutionally incapable of rendering adequate service, and what disposal he recommended—rest with isolation, with distraction, or with occupation, services of a psychotherapist, reclassification, or discharge. Dr. Crichton-Miller concluded:

"What is true of the war neuroses is true of the neurotic disabilities of civilian life. At every point disability, whether resulting from biological or affective causes, is liable to be pressed into the service of a personal aim. . . . What matters to us is that with most of our patients the past and the future are continually in mesh, and no real advance can be made in psychiatry except by those who are sensitive to this constant interaction."

MARINE THERAPEUTICS

At a meeting of the Section of Physical Medicine of the Royal Society of Medicine on October 21 a discussion took place on marine therapeutics.

Dr. K. R. Collis Hallowes of Torquay, who took the chair as the new president of the section, said that classification of the many various marine climates of the British Isles was difficult. Many marine resorts had local characteristics which caused them to differ from other resorts in the same regional group. Conclusions drawn from meteorological data alone might be erroneous. Moreover, individuals reacted in different ways to the same meteorological factors. Some were more weather-sensitive than others, some reacted abnormally but could be re-educated to more normal responses. Marine climates differed from inland climates in various ways. Sun-bathing and sea-bathing were of considerable therapeutic value, but were often abused, and there was need for their careful prescription during convalescence and for therapeutic purposes. Sea-water was a natural mineral water and might be used for all hydrological procedures. Reactions following its use were very similar to those following the use of other waters. The future development of marine resorts for therapeutic purposes required consideration and medical direction, and further research work was essential.

The British Coast-line

Dr. S. Watson Smith of Bournemouth divided the climates of Great Britain into two physiological groups: (1) the stimulating, tonic, or bracing, suitable for those needing toning up after illness or operation; (2) the sedative and relaxing, inducing rest of body and mind. Smaller and less artificial places than the popular resorts had a curative value for many. Much had yet to be done in collecting and verifying information on climate; this might be done county by county by local medical men. The "seaside" should include a littoral to embrace valleys and terraced levels rising from the sea. Sea level or propinquity to the sea was not always desirable.

The east coast of Scotland was to be recommended, during the late spring, summer, and early autumn, for the robust after illness or operation; only in midsummer for the delicate. During fine weather it was indicated for hypopiesis and neuro-circulatory asthenia.

The east coast of England was useful, in the warmer months, for nervous disorder and disease, especially about middle age; also in convalescence after respiratory catarrhs

and inflammations, in chronic bronchitis and emphysema, bronchitic asthma, and post-influenzal weakness. Contra-indications were hyperpiesis, hyperpiesis with chronic kidney disease, advanced arteriosclerosis, and polycythaemia.

The south-eastern region (Kent and Sussex, to Hampshire) was desirable for delicate children and adults at all seasons, particularly for the young with tuberculosis of bones and joints; also after spa treatment in non-specific arthritis, fibrositis, neuritis, and neuralgia. During the summer it was useful in cases of chronic bronchitis, emphysema, bronchiectasis, pulmonary fibrosis, and disease of circulatory system; contraindications were high blood pressure, thyrotoxicosis, and plethora.

The southern region was to be recommended all the year round in the neuroses, insomnia, thyrotoxicosis, high blood pressure, granular kidney, and chronic respiratory disease, including tuberculosis. In summer the delicate did not do so well on this coast; but at all times children convalescent from juvenile rheumatism did well, as did children with asthma. This was a good coast for permanent residence for those struggling against ill-health.

The south-west coast was indicated for subacute and chronic bronchitis, sinusitis, arteriosclerosis, aneurysm, arterial hypertrophy, angina pectoris, degenerative myocarditis, high blood pressure, and senility; contraindications were low blood pressure, and in the case of sick children except at the beginning of convalescence. Patients with arthritis often did well on the Somerset coast.

The north-west coast was for debilitated persons with functional derangements, emphysema, persisting sinusitis, bronchitis, laryngitis, or rhinitis, and sufferers from delayed recovery after acute illness. Except during fine weather, this coast was better avoided: contraindications were fibrositis, any form of arthritis, and subacute and chronic bronchial trouble.

Sir Henry Gauvain dealt with the marine treatment of surgical tuberculosis and septic bone conditions. He said that he had explored the south coast from the mouth of the Thames to the mouth of the Severn to find the best place for the establishment of the marine branch of Alton. He wanted warmth, abundant sunshine, low level, clear air, flat littoral, sheltered position, and south aspect. He found only one place which had all the desiderata, and that was Hayling Island. Some children, those with pronounced cachexia, were not strong enough to respond to sea stimuli. He and those associated with him at Alton could now instantly determine by looking at the children those suitable for marine treatment. It was the child with good powers of resistance and able to respond to stimuli who would do well. A few days were spent by the children in getting acclimatized, and then paddling was started, later spraying, and finally complete immersion.

In the course of discussion Sir Henry Gauvain was asked to compare his results with those of Rollier at Leysin, and he said that he thought results were more quickly obtained at Hayling Island, but statistical comparisons were fallacious, because most of Rollier's patients could come and go when they liked, whereas the Alton children were hospital patients who remained for their cure. The time taken depended on the constitution of the child; the average for the crippled child was from fifteen to eighteen months.

Dr. M. B. Ray asked what was the effect of sea-water in giving massage douches. Sea-water was probably the hardest water imaginable, and he wondered how the hands of the operator could utilize the hard liquid in giving massage which required relaxation of muscles and a soapy kind of water. Dr. Collis Hallowes said that his experience was that massage could be quite effectively given with sea-water and the results were very satisfactory. He had never heard attendants complain of the effect of sea-water on their hands, and it was exceptional to find any irritation of the skin following Aix or Vichy douches for which sea-water was used.

YELLOW FEVER

A meeting of the Royal Society of Tropical Medicine and Hygiene was held at Manson House on Thursday, October 13, when Dr. Fred L. Soper of the International Health Division of the Rockefeller Foundation for South America gave an address entitled "Yellow Fever: The Present Situation, with Special Reference to South America." The president of the Society, Lieutenant-Colonel S. P. James, was in the chair and the meeting was attended by His Excellency the Brazilian Ambassador.

Activities of the Rockefeller Foundation

Dr. Soper related how the Rockefeller Foundation embarked in 1915 on a programme of eradicating yellow fever from the Americas by collaborating in the organization of measures directed against the insect vector—*Aëdes aegypti*—in the known endemic foci of the disease. These measures strikingly reduced the number of cases in the larger cities and ports, but failed to eradicate the disease completely from certain areas in Brazil. That this was not characteristic of Brazil was suggested by the occurrence in 1929 of two widely separated outbreaks at isolated points in Colombia and Venezuela, and it was ultimately shown that there were two hitherto unknown factors to be considered—namely, rural yellow fever transmitted by *Aëdes aegypti* occurring in a localized area of North-East Brazil, and jungle yellow fever, which was widespread and occurred in the absence of *Aëdes aegypti*. The rural type was bound up with the nomadic habits of the people, who moved freely from place to place during pilgrimages and periods of drought, and carried with them in their water-jars eggs and larvae of *Aëdes aegypti*, which readily found new breeding-grounds in the stores of rain-water collected against the drought. When these facts were determined, extensions of the preventive service to the rural areas produced results similar to those obtained in the cities, and yellow fever rapidly disappeared from the regions in which this work was undertaken; in fact, were it not for the existence of the jungle infection, yellow fever might well have disappeared from the Americas in 1934.

The epidemiology of the jungle infections was, however, quite different from that of the other types, although, clinically, the diseases were exactly similar. Urban and rural *aegypti*-transmitted yellow fever was generally acquired indoors; tended to involve non-immune persons of all ages; was spread along the lines of human travel; and was easily controlled by reduction of the density of the vector. Jungle yellow fever, on the other hand, was acquired in or near the forest during working hours by those whose occupation took them to the woods, and did not involve other members of the household. The infection of man was apparently accidental, occurring in the course of some cycle of infection of which man was not an essential part. Recently forest mosquitos (*Aëdes leucocelaenus, Haemogogus capricorni*, and species of *Sabethines*) had been captured and shown to be naturally infected, and, furthermore, there was some evidence that certain monkeys commonly became infected. It was difficult, however, to fit all the observed facts into a simple mosquito–monkey–mosquito cycle of which human infection was but an accidental offshoot.

In the face of this problem the only reasonable hope of preventing human infection seemed to lie in individual immunization of exposed populations. During the first nine months of 1938 more than 800,000 persons had been vaccinated with entirely satisfactory results and without serious complications of any kind. Dr. Soper emphasized the valuable knowledge that had been obtained from examination of livers obtained by viscerotomy, the service which he had organized having made over 140,000 examinations. He stated that viscerotomy, anti-*aegypti* measures, and vaccination were the keys to successful control of yellow fever in Brazil. His Excellency the

Brazilian Ambassador then spoke of the happy co-operation between the Federal and State authorities and the Rockefeller organization.

Mouse-protection Test

Dr. G. M. Findlay showed how the mouse-protection test had revealed the unexpectedly enormous endemic distribution of yellow fever in Africa. There the disease was both urban and rural, but jungle yellow fever in the Brazilian sense had not been demonstrated in Africa, as so far no rural area had been found in which *Aëdes aegypti* was not present. Hepatitis, which in some cases followed the earlier vaccinations, was due to another virus, probably similar to, or identical with, that of epidemic catarrhal jaundice, which had been introduced accidentally into the yellow fever tissue culture. This complication had now been eliminated. Judged by blood tests, immunity lasted two or three years, but tissue immunity might persist longer.

Dr. M. T. Morgan asked whether the mouse-protection test and the liver examinations could be regarded as satisfactorily specific, and Colonel F. P. Mackie mentioned that the results obtained by the mouse-protection test suggested a recent silent spread of the disease around Mallakah in Africa, although there was a strange absence of clinical evidence of the disease. Sir John Megaw raised the question whether the virus, if introduced into India, would spread as in Africa and America. Sir Malcolm Watson admired the organization for the control of *Aëdes*, and expressed the hope that the details would soon be published. With regard to the spread of the disease in Africa he had failed to find *A. aegypti* breeding in trees in Nigeria.

In reply, Dr. Soper stated that he had every confidence in the mouse-protection test and the pathological examination of the liver as indicators of infection. Jungle yellow fever, he believed, was the older and more permanent form of the disease. With regard to Africa, he thought that if the virus ever reached the east coast the worst might be expected, since every boat headed for India would threaten extension of the disease to that country.

ESCAPE INTO INVALIDISM

The Medical Society of Individual Psychology has arranged for a series of papers upon the subject of psychological "escapes" to be given during the present session. At the first meeting on October 13, with Dr. H. C. Squires in the chair, "escape into invalidism" was discussed.

Dr. George Gordon read a brief paper to open the discussion. He suggested that it would help to keep the discussion within manageable bounds if the following types of cases were excluded—namely, malingering, anxiety states, and valetudinarianism in elderly people if it occurred as an accompaniment of organic senile changes in the cerebral cortex. He also excluded hypochondriasis properly so called as representing a psychotic illness with delusion, which would be dealt with later in the session. He believed that the profession now recognized the psychogenic origin of hysteria, but drew special attention to another numerous class of patients, who were best described as people who "enjoyed ill-health." He took as the classic prototype of such patients *Le Malade Imaginaire* of Molière, and pointed out that there is no evidence that Argan in this play is the subject of hypochondriacal delusions. He quoted passages indicating Argan's overweening desire to dominate the household in a multitude of ways, and his constant desire to have members of his household perpetually at hand to help him. Argan's constant ailing was a device whereby he achieved assurance that infallible assistance, as represented by the medical profession, would be available at all times. Dr. Gordon pointed out that *le malade imaginaire* was a man imbued with a sense of insecurity and inadequacy to meet what he believed to be the demands of life. Many people who were reputed to "enjoy ill-health" were persons with a sense of inadequacy. In Dr. Gordon's experience such people were often not endowed with much physiological vigour. Nothing was gained by pooh-poohing the possibility of imperfect health in such cases. . . . "As physicians we can be of the greatest value to such persons by helping them to understand themselves, so that they may face their task in life with such physiological endowment as they possess. We can also encourage them to abandon the desire to achieve a sense of adequacy and security by the domination of others through their own invalidism."

Mental and Physical Pain

Sir Walter Langdon-Brown, in complimenting the opener on the way in which he had defined the issues, brought forward some evidence that the "molluscan" type of escape into invalidism was often subconscious. On another occasion he had defined as necessities for happiness the possession of a definite goal and an emotional interest. When either or both of these were frustrated there was a tendency to compensate by this method of escape. Hippocrates said, "Of simultaneous pain in two places the lesser is obliterated by the greater." Few would doubt that mental pain could be greater than physical pain. Certainly medical men were constantly seeing instances where patients sought a physical pain as a relief to mental pain, for the former could be talked about and would excite sympathy; the latter they preferred to bury in their own bosoms. Then came the magician offering new lamps for old in the form of new pains for old and pains that could be talked about. Physicians should be constantly on the watch for these substitute pains and should seek for the underlying mental or emotional cause. It was clear that in many instances an escape into invalidism enabled the individual to dominate the situation through weakness. Another factor inducing such escape was indecision, for as long as ill-health existed the necessity for solving a problem could be postponed and conflicting factors could be held in balance. A number of cases were reported which illustrated these contentions.

Motivation of Neurotic Illness

Dr. W. R. Reynell said that the conception of neurotic illness as an escape was no doubt true in many cases, but in others it was a passive negative refusal to co-operate owing to a sense of grievance or other motives. In some the motive of neurotic illness might be regarded as a wish to fall ill as an expression of some unconscious feeling rather than as an escape from something—a wish for self-punishment, self-aggression, as an effort to atone for unconscious feelings of guilt dictated by an infantile conscience. Adler had said that every neurosis could be understood as an attempt to free oneself from a feeling of inferiority in order to gain a feeling of superiority. Did this conception of neurotic behaviour always explain the motives which led to anorexia nervosa, self-inflicted injuries, and even suicide, or states of morbid depression and suffering following loss and disappointment? Neurotics, according to Adler, had sought power and freedom from responsibilities to others; but there was another type very liable to fall into neurotic illness—the peace-loving, gentle, often physically timid and easily discouraged person. Dr. Reynell did not think that the "wish to fall ill" was the same as "an escape into illness."

The escape into nervous invalidism implied the adoption of a bad "style of life," the "pursuit of an inferior goal"—the expression of an "inferiority complex," as Adler described it. Many such patients might be described as "evasive compensators," who evaded difficulties and responsibilities and developed neurotic symptoms instead. The subsidence from, or refusal to rise to, a normal adult state of social co-operation and usefulness

might occur at all ages and might arise from the withdrawal of a stimulus or from disillusionment. The type of neurotic invalidism might be determined by (1) "organ inferiority": damage from organic illness or hypogonadism (hysterical symptoms often followed on organic illnesses); (2) the results of operation or accident; or (3) the symptoms might be symbolical of a state of mind. Whatever the symptoms were, the following had to be determined: (*a*) *Why* did the patient fall ill? (*b*) Why did the patient fall ill *when* he did, or, as Adler put it, "What shocked him"? (*c*) Why did the patient fall ill *in the way* he did?

Dr. Edward F. Griffith suggested that life was more difficult in these days and there was a greater tendency to try to escape from responsibilities. This was particularly noticeable in the refusal of many of the younger generation to have children. The older general practitioners were often certain that there must be a physical cause for neurotic illness even if every method of examination had failed to discover it. Often it was extremely difficult for the physician to assess the various factors of causation. He gave examples of neurotic types of illness seen in general practice where either the psychological or the physical origins were finally discovered. In women patients neurotic illness was often made the excuse for a refusal of conjugal relationship or for purposes of domination. The sex life of many married women was unsatisfactory. The cause was not always originally psychological; often it was due to some minor or major physical disability that could be remedied, particularly in cases of frigidity and dyspareunia. He thought that in such cases there should be more co-operation between psychologists and those doctors who made a specialty of sexual disabilities. He mentioned the necessity for inquiring as to the practical expression of emotional feeling—the question of sex technique. An interesting discussion followed in which many members of the Society took part.

Local News

ENGLAND AND WALES

Finsbury Health Centre

The new health centre of the Finsbury Borough Council, which was opened by Lord Horder last week, is an interesting departure, from an architectural point of view, among institutions of this kind. It represents a breakaway from traditional municipal lines; a design has been worked out on the pavilion principle, having in view no other consideration than the needs of the various public health services to be controlled and organized in the building. These services are a dental clinic, a tuberculosis dispensary service, to which is attached an *x*-ray department, a solarium for ultra-violet ray treatment (to be given to adolescents or adults requiring it, upon the recommendation of a practitioner), a foot clinic (a new venture, set up in view of the widespread disability arising from minor ailments of the feet), and a clinic for diseases, again of a minor character, peculiar to women, for which there has been up to now no special provision in the borough. The building will also include cleansing and disinfecting stations, a mortuary, and a bacteriological laboratory for the diagnosis of infectious and contagious diseases, the examination of milk, and the like. Thus there will be accommodated under one roof all the health services administered by the local council with the exception of maternity and child welfare. There are two maternity and child welfare centres in the borough, both in comparatively new premises and advantageously situated with regard to the areas they serve, and it has been decided to leave them where they are.

The building corresponds to a wide letter H; by this means congested approaches have been avoided and a maximum of sunlight and cross-ventilation obtained. The crossbar of the H forms on the ground floor an entrance hall walled with glass bricks and very attractive in appearance. It is approached by a ramp, a piece of thoughtfulness for the large proportion of users of the centre who will be sufferers from some physical disability. With the same object all the clinics are on the ground floor and accessible from airy, well-lighted corridors, so planned as to avoid the tunnel-like effect of many such passage-ways. One upright of the H contains the tuberculosis clinic, including consulting-room, surgery, laboratory, and *x*-ray department, with special accommodation for artificial pneumothorax treatment. The opposite upright contains the women's, dental, and foot clinics. On the first floor are lecture hall, administrative offices, and reception wards, separated by a common kitchen, for men and women who are temporarily dehoused for sanitary reasons. The disinfecting and cleansing stations are in the basement with separate access from the rear. Many interesting details take the attention, such as the large continuous ranges of windows, the radiant heat panels concealed in the ceiling, the reinforced concrete walls lined with cork slabs to afford sound and heat insulation, the facing of the concrete with tiles of pale cheerful tints, the open forecourt laid out with grass and shrubs, and the roof terrace. The planning has been such as to allow for all possible flexibility in the disposition of the rooms, and if rearrangement of departments or the installation of fresh equipment becomes necessary partition walls can be removed without major structural alterations. The building has been designed by Messrs. Tecton, the architects responsible for the new buildings at the Zoo and at Whipsnade, and many of the ideas incorporated in the enterprise owe their origin to the chairman of the public health committee of Finsbury Borough Council, Dr. C. L. Katial. The centre is in Pine Street, close to Farringdon Road, and only a short walk from Finsbury Town Hall.

St. John Ambulance Brigade

The second annual week-end conference of the surgeons of the St. John Ambulance Brigade was held in London on October 15–16 under the presidency of Dr. N. Corbet Fletcher, surgeon-in-chief. All districts of the Brigade were represented, including the Priory for Wales and the Irish Free State. Considerable attention was paid to matters relating to the Brigade's work in connexion with the A.R.P. and the local anti-gas certificates. Some aspects of competitions came up for consideration, as did also the revised *Textbook* with demonstrations of loading the stretcher face downwards. The subjects for discussion included diabetic coma, the issue of certificates, the promotion of surgeons, and the general regulations. The guest of honour at the annual dinner on the first day of the conference was Sir Herbert Creedy, G.C.B., K.C.V.O., Permanent Under-Secretary for War.

Research at Birmingham

The City and University of Birmingham Joint Board of Research for Mental Disease has continued its unspectacular but useful work during the past year, and its annual report sets out the progress that has been made. Several more thick sections of brain have been examined for capillary irregularities and the findings correlated with the clinical diagnoses. Work has been started on the relation of chronic septic infections to cerebral capillary irregularities, and a number of brains have been examined after Gram staining. As was to be expected, Gram-positive organisms were found in a few cases only. There is some evidence that Gram-positive organisms lose their positive character after many days, and examinations are now being made of sections of brain stained to show Gram-negative organisms. The capillary stain technique showed areas of ischaemia in nearly all and areas of congestion in the greater proportion of cases. Many specimens also showed haemorrhages, thromboses, or perivascular granules. An endemic of

clinical and subclinical dysentery caused a large increase in the total number of specimens examined in the laboratory. Out of 2,037 specimens of faeces examined for typhoid-dysentery organisms, abnormal organisms were isolated in 1,992. The special care which the results indicated is believed to have averted an epidemic. A large number of supposedly non-pathogenic salmonellas were found, especially in the clinical dysentery cases. Aberrant coliform organisms were high in the dysentery cases and below average in the typhoid carriers. Another interesting point is the low incidence of streptococci in the typhoid carrier cases as compared with the average. The research work of the Board is now in process of being transferred from Hollymoor to the new Medical School of the University. When the transfer is complete it is anticipated that Dr. Stanley Barnes, Dean of the Medical Faculty, will take up the position of Honorary Director of Research and Chairman of the Advisory Board.

An Old Medical Charity

A quarterly court of the directors of the Society for Relief of Widows and Orphans of Medical Men was held on October 12, with Mr. V. Warren Low, president, in the chair. The audited accounts for the half-year ended June 30 were presented and approved. From them it was shown that £2,210 had been distributed in grants among the sixty-one widows and five orphans in receipt of relief. The income for the half-year amounted to £2,979, and £250 Consols at 2½ per cent. had been purchased. It was decided that a Christmas present of £5 be made this year to each widow and orphan in receipt of grants, entailing an expenditure of £330. A donation of £2 2s. had been received from the South-West London Postgraduate Association. Grants amounting to £2,208 were voted, subject to the approval of the visitors, for the payment of the half-yearly grants due on January 1, 1939. On October 29 the society celebrates its 150th anniversary, and it is probably one of the first, if not the first, medical relief society to be established. It was founded in 1788, and two members of the same family, father and son, have been secretaries for seventy years. Membership is open to any registered medical man who at the time of his election is resident within a twenty-mile radius of Charing Cross. Election is by ballot. Full particulars and application forms for membership may be obtained from the secretary of the society, 11, Chandos Street, Cavendish Square, W.1.

SCOTLAND

Vital Statistics for Scotland

The report of the Registrar-General for Scotland for 1937 shows that the estimated population at the middle of the year was 4,976,600, of whom 2,396,900 were males and 2,579,700 were females. The population has increased since the census of 1931 by about 133,600 persons, mainly attributable to excess of births over deaths. The number of births registered during the year 1937 was 87,810, including 45,035 males and 42,775 females. This gave a birth rate of 17.65 per 1,000 of the population, slightly less than in the previous year and the lowest recorded except for the year 1933, when the rate was 17.62. The highest birth rate recorded was in 1876, when it was 35.62; since then the general trend with minor fluctuations has been steadily downwards. Deaths registered during the year numbered 68,942, giving a rate of 13.85 per 1,000 of the population. The general trend of the rate has, until the last three years, been steadily downwards, from 23 per 1,000 in 1864 to 12.92 in 1934; since 1934, however, each year has shown a slight increase. The standardized rate shows a direct relation to urbanization, for it was 12.36 in landward areas, 12.95 in small burghs, and 15.08 in the large burghs. Deaths of children under 1 year numbered 7,050, giving an infantile mortality rate of 80.3 per 1,000 births, a diminution of 2.0 as compared with that of the previous year. With regard to causes of death, the principal epidemic diseases accounted for 4,468 as compared with 2,719 in the previous year, the increase being attributed chiefly to an epidemic of influenza in January and February, and to an increase in the number of deaths from whooping-cough. Deaths from diphtheria numbered 426, giving the same rate as before. Scarlet fever, with 123 deaths, and measles, with 119, both showed substantial decreases. Tuberculosis accounted for 3,663 deaths with a death rate the same as for 1936 and 1935. Deaths from malignant disease numbered 7,810, giving a rate slightly less than that for the previous year but slightly more than the previous five years' average. Diseases of the circulatory system accounted for 15,732 deaths, and it is pointed out that in eleven years they have increased from 7,375 to this figure, the largest increases being at ages over 65. Diseases of pregnancy and childbirth numbered 424, being 70 fewer than in the previous year, while deaths from puerperal sepsis, numbering 144, were 51 fewer than in 1936. Deaths from all puerperal causes gave a rate of 4.8 per 1,000 births, of which the rate for sepsis was 1.6.

New Aberdeen Professor

Dr. Robert Stevenson Aitken, F.R.C.P., has been appointed Regius Professor of Medicine in the University of Aberdeen in succession to Professor L. S. P. Davidson, resigned. Professor Aitken is of Scottish parentage and was educated in New Zealand, where he graduated M.B., Ch.B. at the University of Otago in 1923. After acting as house-physician and house-surgeon in Dunedin Hospital he was a Rhodes scholar at Balliol College, Oxford, in 1926. Later he became assistant pathologist in the London Hospital, and assistant physician to the medical unit, London Hospital, in 1930. Since 1935 he has been University reader in medicine and assistant director of the medical department in the British Postgraduate Medical School, London.

Crichton Royal Institution, Dumfries

The directors of this well-known mental hospital on October 18 opened an important addition to the institutional buildings in the shape of an extensive centre, Easterbrook Hall, erected for recreational and therapeutical purposes. The structure, with equipment and furnishings, has cost about £60,000, and contains, in addition to a large hall in which there is a stage and cinema installation, separate sections in which are housed operating theatre, dental surgery, accommodation for *x*-ray and other electrical treatment, a hydrotherapy section with baths and swimming pool, fully equipped gymnasium, arts and crafts section, hairdressing saloon, library and reading room, and tea room; also facilities for sun-bathing. Dr. M'Cowan, the medical superintendent, said that they were learning the value of recreation and occupation in mental cases, and also how to apply physiotherapy and electrical and light treatment. The primary aim of physical medicine was to build up the patient's physique and defensive mechanism, and psychiatrists had found that this was useful not merely in physical disease but also in nervous and mental disorders. Dr. C. C. Easterbrook, after whom the new building is named, performed the opening ceremony. He said that there had been numerous additions to the institution since the foundation stone of the original Crichton Hall was laid in 1835. Modern hospitals, villas, and nurses' homes had been added as well as the Crichton memorial church in 1897, and, later, a model home farm with tuberculin-tested herd, an artesian water supply, an electric light and power installation, and pathological laboratories. All these had placed the Crichton Institution in a unique position among mental hospitals. The institution comprised three separate departments with distinctive hospital observation and convalescent sections, still further subdivided into units. This enabled a proper classification of patients, which was the first step in all treatment, to be a special feature at the Crichton

Royal Institution. The latest addition for the more specialized forms of physiotherapy and psychotherapy would render the institution unsurpassed in the amenities it offered.

Edinburgh Nursing Scheme

The Scottish Council of the Queen's Institute of District Nursing has devised a scheme of nursing benefits for Edinburgh which began on October 24. There is already in operation a home nursing contributory scheme established by the Institute in 1925 with a membership of over 30,000 in Edinburgh, including employees in factories, shops, offices, and warehouses, who may join in bodies of not less than five persons at an annual subscription of 2s. 2d. paid at the place of employment. The new scheme enables other persons to join individually at a subscription of one penny per week, or 4s. 4d. per annum, which is collected at the place of residence. This subscription entitles members to nursing benefits for themselves or for non-wage-earning dependants, but not to maternity nursing or attendance at operations, which, however, can be obtained for a small additional fee. As regards arrears in payment, the member is out of benefit if more than six weeks without payment have elapsed, but may return to benefit fourteen days after paying the arrears; after twelve weeks without payment membership lapses, although the member may rejoin, but not during an illness. The scheme is not intended to apply to persons who are in a position to employ a private nurse, although persons above the income limit may obtain the nursing service for their indoor domestic staff on payment of 10s. annually.

Glasgow Post-graduate Courses

The winter session of the Glasgow Postgraduate Medical Association opens next month. A series of weekly demonstrations for practitioners on Wednesday afternoons will open at the Stobhill Hospital on November 2, when Professor Noah Morris will speak on deficiency diseases. The demonstrations, covering a wide range of subjects, have been arranged on similar lines to those of previous years. The fee for the course is three guineas. Courses have also been arranged at the Glasgow Eye Infirmary for those interested in ophthalmology, and facilities for the study of clinical obstetrics and ante-natal work are offered by the Royal Maternity and Women's Hospital. A practical course on refraction will be given at the Ophthalmic Institution. A course in radium therapy is offered at the Glasgow and West of Scotland Radium Institute, and at the Glasgow Royal Cancer Hospital if a sufficient number enrol. A course of lectures in psychopathology, with special reference to the neurotic illnesses of children, will be given at the Royal Mental Hospital, Gartnavel, on Mondays at 8 p.m., from January 16 to March 20, 1939. The fee for the course is two guineas. A limited number of clinical assistantships are available at most of the institutions taking part in the work of the association during the winter months as well as at other times of the year. Full particulars can be had from the secretary, Postgraduate Medical Association, the University, Glasgow.

Glasgow University Graduation

Sir Hector Hetherington, the Principal of the University, presided at the graduation ceremony at Glasgow on October 16 and conferred the degree of Doctor of Medicine upon three graduates and those of M.B., Ch.B. upon 103 graduands. In his address he said that the September examinations had taken place during a time of anxiety and strain, and the examiners had been surprised at the remarkably high level achieved by candidates working under such conditions. This showed steadiness of nerve. They now had an assured place in the work that lay ahead, and the opportunity of doing what they could for the safety of this country and its honourable duty in working towards a happier state of international relations.

Correspondence

Civil Medical Organization in War

Sir,—In the recent crisis I, like many others, could not help reflecting upon the personal effect which war, had it come, would have produced, and contrasting this with the outlook at the beginning of the last war. In August, 1914, I was a subaltern in one of the batteries of the H.A.C., and throughout the war I served in the Artillery. In 1914 I entered the war feeling confident that the careful preliminary training through which I had passed would be put to good purpose, and was stimulated by this thought. During the recent crisis, however, the certainty that my professional services would be called upon to the full as soon as war began brought only a sense of overwhelming bitterness. The number of dead and wounded for whom provision would have had to be made has not been publicly stated, but would run into very many thousands in every twenty-four hours, at any rate until a large portion of the population had been evacuated, and for every person wounded there would be one dead. In France and Flanders we were always supported by the feeling that every man in the field was contributing something to the common task. In September, 1938, I could see ahead of me only unending hours spent in rooms filled with operation tables, attempting to repair the terrible wounds produced by bombs. The patients would not be soldiers whose sufferings were to some extent balanced by the losses they had just inflicted on the enemy, but civilians whose very presence in London would be an encumbrance, and in most instances only make the maintenance of its essential services more difficult.

It seems likely that the call which war will make upon the medical profession in London and other of the more vulnerable cities will be greater than upon any other class of the community, only excepting those who will fight in the air. Our numbers are very limited and the task imposed upon us will be immense. Surgical and medical treatment will have to be carried out unceasingly and under conditions far more exacting than any experienced in the last war. Rest during such periods of off duty as are available will be broken by air raid warnings proclaiming the need to be "alert," and even if we could grow enough accustomed to these to ignore them, the noise of gun fire and bomb explosions would make sleep impossible. While the earning of a livelihood by private surgical practice in London will have passed away, our duty to the public will compel us to remain. Dr. Clement Francis in the *Journal* of October 22 (p. 862) draws attention to the uselessness of providing ". . . the most efficient medical service conceivable if the number of casualties is going to be tens of thousands, all occurring in the space of a few minutes." I believe that it is the duty of the medical profession to spare no effort to convince the public of the very urgent need to plan, first, the speedy evacuation from London of all whose presence is not essential, and, next, protection for those who of necessity must remain, for London will indeed be the front line. Unless this can be done the casualties are likely to reach proportions which will completely overwhelm the medical services, many of the wounded will be left for long periods untreated, and the dead unburied. The construction of adequate roads leading out of London, and of shelters within it, should be begun at once.—I am, etc.,

R. Ogier Ward, *D.S.O., M.C.*, F.R.C.S.

London, W.1, Oct. 24.

Air Raid Precautions

Sir,—The lesson we as doctors should learn from the present A.R.P. muddle is the futility of working as individuals, or even as hospital units, and the absolute necessity for a central controlling organization to correlate our work.

If war comes it will be the civilian who will be in the front line, and therefore it is the well-proved methods of military evacuation of wounded that ought to be provided for the civil population. Those of us who went through the war are familiar with the long chain of units from first-aid posts in the immediate fighting area to base hospitals far from the centre of attack. It is an organization like this we require for the civil population in any future war. Sir Frederick Menzies makes this quite clear in his letter (*Journal*, October 22, p. 860). As he points out, anyone with practical knowledge of administration knows that there must be "unit control"; in other words, some one central authority must have control of aid posts, ambulance service, and hospitals. This central authority must staff and control all the hospitals, voluntary and municipal, and this authority must apportion the casualties to the hospitals so as to prevent overcrowding or undercrowding.

An attack on a great city like London should be visualized as a battle. There will be the dead; there will be the dangerously wounded; there will be the slightly wounded; and, as in any battle, the slightly wounded will vastly outnumber the rest. It is they who will flood the hospitals if not prevented. Even in the war, with disciplined men, it was not easy to avoid this. All casualties should be sorted out at the aid posts, and these aid posts should be in bomb-proof shelters and properly staffed. Hospitals in the great cities should be clearing stations only. No one in the war ever thought of keeping casualties in the front line. London and all great cities in future wars will be in the front line.

The idea of concentrating numbers of highly skilled men in the great teaching hospitals to handle casualties is absurd. No hospital will be immune from attack. It takes ten years to make a surgeon, and to risk a concentration of technical ability in any building that is vulnerable is doing a disservice to the public.

The experience of Barcelona has shown that a panic evacuation of the civilian population is not necessary if bomb-proof shelters are made. Dr. Clement Francis has pointed out in your columns (October 22, p. 862) that if such shelters are provided now the problem of evacuation is solved. Such shelters would immensely minimize the percentage of casualties in an attack. Such shelters should be provided with aid posts adequately equipped to handle all casualties as they occur, and to evacuate such as need further treatment to hospital. If, then, we had a proper central organization to collect and evacuate casualties from these aid posts we could face air attacks in the future with comparative equanimity.—I am, etc.,

J. Johnston Abraham,
Formerly A.D.M.S., Lines of Communication, Egyptian Expeditionary Force.

London, W.1, Oct. 22.

Sir,—I absolutely agree with Dr. Clement Francis's letter on air raid precautions. Prepare hospital accommodation of course, but try to prevent there being much need for it by providing sufficient bomb-proof shelters. The effect of the modern high-explosive bomb is devastating, and, in my opinion, the casualties from gas would be negligible by comparison. The only gas that caused really heavy casualties with a big mortality during the war was chlorine released from cylinders, which could obviously not be used against our civil population. No country is going to bomb with gas extensively when high explosive would cause ten times the damage. I think that the issue of gas masks in remote country villages is a waste of money which should be spent on providing deep shelters for everyone in our large cities.—I am, etc.,

Colchester, Oct. 22. Cyril Helm.

Protection Against Gas Poisoning

Sir,—Recent circulars relating to air raid precautions and the use of gas masks emphasize the point that the latter do not protect us against the poisonous effects of common coal gas. It is further pointed out that infants for whom no gas mask is available may be wrapped in a blanket and carried safely in this way through the dangerous zone. The following personal experience not only supports this last statement but goes further and shows that the blanket will also protect against coal-gas poisoning.

In 1902 I was acting as a district medical officer and was also engaged in general practice in a suburb of London. I attended a patient in her confinement, and four months after this event I was summoned urgently to this patient's home to find her and a boy and girl of 6 and 8, respectively, dead in various parts of the room owing to gas poisoning from a leaky meter, but the baby of four months was lying in the bed covered by blankets. The infant was still alive, and suffered no ill effects.

At the subsequent inquest the coroner asked me how I explained the infant's escape, but he disagreed with my suggestion that the blanket performed the function of a filter or mask. It would be interesting to ascertain whether the wool of the blanket is an important factor in these circumstances, and whether an equal thickness of cotton or silk cloth would afford similar protection. It should be possible for chemists engaged in gas warfare work to supply the answer.—I am, etc.,

London, W.1, Oct. 20. John F. O'Malley.

Modern Decline of Breast-feeding

Sir,—I read with much pleasure the valuable paper by Dr. J. C. Spence in the *Journal* of October 8. I hope it will not only be read but digested by those working in nursing homes, maternity hospitals, and teaching centres. In the course of many years' attendance at an infant welfare centre, mothers sent from institutions have often stated that breast-feeding was tried for two days and then given up. But surely, as Dr. Spence points out, one can hardly expect the flow of milk during the first two days. There is another idea that seems to me to be erroneous. Mothers are often advised to give up breast-feeding if they have the misfortune to develop a breast abscess. As a rule breast-feeding can be continued from the opposite side, and the milk will return in the damaged breast when it heals. The last sentence in Dr. Spence's paper may surprise some, but it does not surprise me; knowing that paediatrics has always been the Cinderella of medicine, one would have thought that a course of postgraduate teaching in infant feeding and diseases of children would be one of the most important subjects for instruction.—I am, etc.,

Sheffield, Oct. 17. H. Leader, M.B.Lond.

Sir,—I recently visited a New England hospital. It was a pleasant place, well equipped and staffed, in a well-to-do town, and largely used by private patients. There was

much evidence of thoroughly kind and unhurried attention to all. I was shown round by the physician in charge of obstetric work, and we reached the maternity wing shortly after noon. The first baby that I saw was in a duty room lying on its back in a crib, with a nurse standing over it and holding a bottle in its mouth. The physician told me, "This little one was born at 5 o'clock this morning." I asked why it was having a bottle. I was told: "It has to have formula, because its mother hasn't any milk yet." We went next to a two-bedded ward where the babies were each 4 days old. Each mother was lying on her back on one side of the bed with her infant on its back on the opposite side of the bed, and each mother was stretching out a hand across the gap between herself and her infant and holding a bottle in its mouth. The conspicuous thing about these babies was that they were entirely "untouched by hand"; a space was maintained between themselves and their mothers, and the babies lay outside the bed covers which were over their mothers. Outside the ward I asked why they were having bottles, and was told: "They have formula when there is deficient breast milk."

By the time we had finished our tour we had seen every baby in the place. Every one was on formula, and every one was receiving its formula in the same detached manner. Not one baby was at the breast. I then asked, "Do any of your patients breast-feed their babies?" and I received a final reply: "We find that very few American women can feed their babies."

I saw two other departments in the maternity wing—the nursery, a large room full of little cradles which were mostly empty but were filling up again now "formula" was over; and the "circumcision room," where I was told that "We strongly encourage every mother to have her baby boy circumcised before she leaves us."—I am, etc.,

London, N.7, Oct. 18. ANNA R. GLOVER.

SIR,—Dr. J. C. Spence's paper on the modern decline of breast-feeding proved very interesting. There is, however, an apparent fallacy in the figures he quotes from the studies of Grulee and Sanford in Chicago. There is nothing to indicate that the 20,000 babies whom they investigated were equally well fitted from birth to maintain an extra-uterine existence. Let us assume that the vitality of some of these newborn infants is less than it should be. Are these not just the infants who will fail to make progress on breast-feeding, will be perforce put on to artificial feeding, and whose subsequent demise will be attributed not to lack of inherent vitality but to the evil effects of artificial feeding? This lack of vitality may be found in two groups of cases, possibly not entirely unrelated. The first is that group in which sterility, early miscarriage, stillbirth, neonatal death, and death under 12 months of age may be regarded as varying results of the same basal conditions. To appreciate the conditions existing in the second group one must consider the mother and child as one unit. This unit either is or is not having its adequate amount of vitamins, and as a result is either full of vitality, energy, and a tendency to survive, or has none of these desirable features.

It must strike the family doctor quite often that although breast-feeding is the ideal one cannot expect the infant breast-fed by a thin, flat-chested, anxious, overworked mother to flourish according to the expected standards. Can the food from this mother compare with the modern prepared food which is derived from "well-fed contented cows" (as the advertisement has it), living under what are for them ideal conditions? In 1929 the North Kensington Medical Society drew up a report on the infant mortality rate in Kensington as the result of an investigation by a group of practitioners in the area of the available statistics regarding the deaths of infants up to the age of 12 months. The following sentences may be quoted: "If it is accepted that environmental conditions can so affect a mother that an infant at birth is lacking in vitamins, it seems likely that breast milk will be similarly lacking. Could a more unsuitable person be found to breast-feed this particular infant?"

I cannot agree with Dr. Spence's conclusions that the decline in breast-feeding is due to indifference and to the lack of the doctors' education, since it is a well-known fact (as mentioned in the review of Dr. G. T. Wrench's book *Wheel of Health* in the *Journal* of October 15) "that different individuals show a different susceptibility to dietetic defects, and recently in the laboratory a Mendelian variety of rats has been obtained which succumb to rickets when the vitamin content of the diet is lowered more readily than normal rats. How far can such genetic factors account for differences in physique in different groups of mankind?"

As a general practitioner, I feel I should mention two facts which confirm one's disbelief in the advice usually given to all and sundry as to the desirability of breast-feeding. It is not at all uncommon to encounter cases of rickets in breast-fed babies. It is also a common occurrence for practitioners to find that in the case of an unhappy mother with an obviously unhappy baby the only cause for their many symptoms is that the impossible is being attempted. The change which occurs when the struggle is abandoned, when the baby obtains adequate nourishment and the mother sufficient rest, is dramatic, and the later results of artificial feeding have never in my experience been unsatisfactory. The manufacturers of modern artificial foods are well aware of what is necessary in the make-up of these if they are to produce satisfactory results in practice. I think that the whole position was quite well summed up in one of the findings of the committee of the North Kensington Medical Society: "In suitable cases, where the mother has a natural capacity for breast-feeding and a placid temperament, there is no better method of infant feeding. It seems likely, however, that the environmental conditions under which many mothers attempt to produce breast milk may be as likely to lead to bad results as the somewhat similar conditions which lead to the production of unsuitable cow's milk. Especially is this so if we add the effect of financial and domestic worries to the results of poor feeding, lack of fresh air, and lack of sunlight."—I am, etc.,

London, W.10, Oct. 15. HORACE A. NATHAN.

SIR,—I would like to thank Dr. J. C. Spence for his excellent article on the decline of breast-feeding (October 8, p. 729). Is it not possible that this decline is in some way connected with the recent rapid rise of municipal child welfare clinics? I run a children's welfare clinic at my house one afternoon a week, and it often happens that I advise a mother to persevere with breast-feeding. Subsequently I have learned that the patient has gone to the clinic and obtained some patent food, usually at a reduced rate. My point is that in my opinion the chief use of these clinics to working-class mothers is merely as a depot for cheap milk. This attitude is definitely encouraged by health visitors, who point this out as an inducement to mothers to attend the clinic; it is probably further encouraged by the staff of the clinics.—I am, etc.,

Carshalton, Oct. 10. J. SIMON.

Infections of the Hand and Fingers

SIR,—I have followed with interest the excellent articles on infections of the hand and fingers (*Journal*, October 1, p. 715; October 8, p. 754; and October 15, p. 798). I feel, however, that the incisions advised by Mr. Norman C. Lake, as illustrated, call for comment. The "cod-mouth" incision for infection of the pulp is not infrequently followed by marked retraction of the pulp flap and leaves an ugly scar, which interferes with delicate touch. The exceptional use of transfixion of the pulp, unless the incisions be more lateral, would certainly interfere with touch on healing.

The incisions over the middle and proximal phalanges should again be more lateral, for two reasons: infection spreads backwards from the front of the finger on to the dorsum, and the incisions as illustrated might not interrupt this spread; also, in highly infected and semi-gangrenous conditions the tissue between the small incisions may break down, resulting in an infected wound across a flexure (deplored by J. B. Murphy). This lack of respect for "flexure rule" is seen in the distal incision for the tendon sheath of the flexor minimi digiti, and the middle one would certainly cut the ulnar nerve. The upper incision of the tendon sheath of the flexor longus pollicis in a swollen condition of the area endangers the median nerve, and a considerable amount of dissection among important structures is necessary to reach the distended sheath. Surely it is better to be guided by Kanavel and approach from the side.—I am, etc.,

Liverpool, Oct. 17. R. KENNON.

Thimble for the Surgeon

SIR,—Mr. T. E. Coulson has drawn attention in his note in your issue of October 15 (p. 789) to a most valuable technical procedure which should be further known because it seems that many are still unaware of this method, first described by Sir William de Courcy Wheeler in the *Medical Annual* of 1925, and again described by him in the *Journal* of June 6, 1931. This method of cutting down upon the finger protected by a thimble is the most safe and precise way of making a counter-drainage by a stab incision not only in pelvic abscess but in the course of any laparotomy, and a thimble should find its place in every surgeon's kit of instruments.—I am, etc.,

A. DICKSON WRIGHT, M.S., F.R.C.S.

London, W.1, Oct. 18.

"Salt-water Boils"

SIR,—"Salt-water boils" are an affliction of deep-sea fishermen. The condition is so prevalent and so definite that the term "salt-water boils" conveys a very clear clinical picture to any practitioner who has once seen it, and an equally vivid but painful picture to any fisherman who has once suffered from it. The disorder affects only those men directly concerned in the handling of fish on deck; of these the boatswains are most severely affected by reason of their having to stand with upraised forearms beneath the bag of fish preparatory to releasing the catch on to the deck. It does not affect those not concerned with the handling of the fish—that is, engineers, cooks, and skippers.

Two types of lesion occur, one affecting the radial aspects of the wrists, the other the upper parts of the forearms. The lesions on the wrists result from the constant chafing of the oilskin sleeve on an area saturated with sea-water, which is hypertonic. The skin becomes thickened and a chronic inflammatory reaction, produced by the constant trauma inflicted by the sharp edge of the oilskin, gives rise to a raised, reddened area on which small pustules form from infection of the follicles. The chronic inflammatory process acts as a barrier to the spread of infection, but if a woollen or flannel sleeve is worn as a protection the traumatic inflammatory change does not occur, with the result that the folliculitis which ultimately supervenes is more severe, and comparable with that which occurs on the upper parts of the forearm. During rain-storms the wrists are soaked with a hypotonic solution and the lesion on each wrist is markedly aggravated. The lesion on the upper part of the forearm consists of a severe folliculitis with an acute inflammatory reaction round the central points of infection. The inflammatory areas coalesce, with the production of a swollen and intensely inflamed forearm. The centre of each inflamed area gradually sloughs and discharges after several days.

No other part of the body is affected and there is generally no constitutional disturbance. The lesions are staphylococcal in origin and no immunity is produced. The scars caused by these "salt-water boils" are as occupationally pathognomonic as the blue scars of the collier.

Although the condition is unquestionably occupational, compensation under the Workmen's Compensation Act is refused (at least in this port) on the grounds that: (1) there is no antecedent history of injury; (2) the lesions are "boils" and therefore outside the Act: the prefix "salt-water" is ignored, as is the significance of its widespread use throughout the British Isles; (3) the condition is not one of "sepsis." The most successful prophylactic I have used so far is acriflavine emulsion (*B.P.C.*). The emulsion is rubbed into the forearms before going on watch; the forearms are washed well with soap and water after coming off watch, and a little of the emulsion is again rubbed in. Many theoretical methods of prevention fail because they are too complicated for tired men to bother with, or are hopelessly impracticable under sea conditions. I would be grateful if practitioners in other fishing ports who see this condition would give me the benefit of their experience, particularly with regard to the questions of compensation and of prophylaxis.—I am, etc.,

Milford Haven, Oct. 17. W. BURNETT EVANS.

The Treatment of G.P.I.

SIR,—In your annotation on the report on malarial therapy in the *Journal* of October 15 (p. 796) it is mentioned that of between five and seven hundred cases of general paralysis yearly since 1927 about 15 per cent. are said to have been discharged "cured." I presume by the word "cured" is meant a full remission, as the subsequent history of these cases cannot yet be fully ascertained. You also state that "the report does not concern itself with the mechanism of the therapeutic action or with any comparison with other methods of inducing pyrexia." Kraepelin's compilation of 3,079 cases treated with malaria showed a death rate of between 10 and 30 per cent. due to the malaria and a remission rate of about 20 per cent., while of Neymann's collection of 979 cases treated by electropyrexia 27 per cent. showed a full remission with a death rate as a result of the treatment of only 2 per cent.

Surely in view of the extreme seriousness of infecting patients with malaria who are already suffering from serious disease of the central nervous serum an authoritative comparison with other methods of treatment is long overdue.—I am, etc.,

St. Mawes, Cornwall, Oct. 17. B. H. SHAW, M.D.

"Giving up Smoking"

Sir,—The abandonment of tobacco is often indicated on medical grounds, but individual patients differ in their reaction to this deprivation. Some people find the sacrifice a trifling matter, and in most cases the sense of loss vanishes in a few weeks. There remains, however, a certain class to whom the surrender of their accustomed "normalizer" is a real and prolonged ordeal, and in these cases a medical man may be asked for some means of mitigating the distress entailed by the prohibition of tobacco.

In the course of my work on drug addiction I observed that persons who were undergoing the form of belladonna medication associated with my name often lost all desire for tobacco as treatment progressed. I had not intended to produce this result, for, when a dangerous drug has been given up, the minor indulgence of tobacco is beneficial rather than otherwise. Six months ago, however, a number of such patients were invited to co-operate in a simple experiment—namely, that of deliberately refusing the unwanted cigarette and only smoking when they really felt the need. When the mechanical part of the habit was thus diminished by a trifling exercise of will, the need for tobacco soon ceased. More recently several inveterate smokers who had failed to cure the habit for themselves underwent a simplified form of treatment with good results.

If any particular patient knows that the abrupt stoppage of tobacco will be a formidable undertaking, he will have to consider whether it is worth his while to set aside a week for adequate treatment. He will need to keep very quiet over this period, and for the last few days to be more or less confined to bed, for only when rest is fairly complete can a satisfactory result be expected. Minute doses of drugs of the belladonna group (for example, atropine grain 1/1,000 rising to 1/500, orally) are administered every two hours, in such a way that, while the heart-beat is appreciably retarded, no physiological symptoms are observed by the patient. Dryness of mouth and ocular symptoms signify that the dose is too large and must be reduced. On his part the patient must promise never to smoke unless he definitely feels the appetite for it, and must throw away the cigarette that he is not enjoying.

The process is simple, but if the doctor sees his patient once a day to be sure that vagal preponderance (as shown by a slowing of the heart-beat while at rest) is being constantly produced, he will find that tobacco becomes progressively less attractive and finally ceases to be desired.—I am, etc.,

London, W.1, Oct. 18. G. Laughton Scott.

Adult Scurvy

Sir,—I was interested in the paper by Dr. G. H. Jennings and Surgeon Lieutenant A. J. Glazebrook on this subject in the *Journal* of October 15 (p. 784). For every case showing a full clinical picture of the disease one must encounter many persons suffering from subclinical states of the same condition. Happily, a moment's inquiry into the patient's diet will indicate whether further investigation is worth while.

May I instance the case of a man of 29 whom I saw recently, complaining of petechial spots on the legs, "blood blisters" in the mouth, and a sore tongue. He had had two previous severe attacks of the same spots, diagnosed as "purpura," while serving in the Indian Army, during which period he had developed foul, bleeding, spongy gums, necessitating removal of all his teeth. At that time he had taken no fruit for some months. Since residing in this country he had noticed two years ago one crop of petechiae on the shins which persisted for a few days. Apart from slight fatigue at the end of his day's round as postman, he had had no further symptoms until the onset of his present oral and skin haemorrhages. He did not care for fruit, and although he occasionally took a fresh vegetable salad with his meals he had, in fact, had no fruit for the past month. Examination revealed a healthy-looking man with petechiae on the legs only up to the line of the garters, though petechiae also appeared on the arms a day or two later. The liver and spleen were not palpable; the blood pressure was 140/82 mm. Hg. No abnormal physical signs were detected in the lungs or heart; the urine contained no blood.

The patient's garters had performed a ready-made capillary fragility test, and a modified Harris and Ray test showed a deficiency of just over 900 mg. of ascorbic acid. No further petechiae appeared after saturation with ascorbic acid, and with regulation of his diet the patient has since been well and has lost his fatigue.—I am, etc.,

Essex, Oct. 19. R. N. C. Smith.

Sir,—It is surprising to read that Dr. G. H. Jennings and Dr. A. J. Glazebrook find adult scurvy to be a rare condition. In this city at least it is quite often seen, and the diagnosis can readily be made on clinical grounds if the possibility of its occurrence is borne in mind. The following are brief accounts of the thirteen cases seen at this hospital during 1937:

Case 1.—Male, aged 73; single; admitted June 6, 1937. Haemarthrosis right knee, for one month; purpura right arm; gums normal, no teeth. Deficient diet, little fruit.

Case 2.—Male, aged 74; single; admitted June 21, 1937. Swelling of legs for three weeks; purpuric haemorrhages both thighs. Teeth loose and septic; soft gums. "Not eaten much for some time."

Case 3.—Male, aged 76; widower; admitted June 29, 1937. Three weeks' ecchymosis right ankle and left knee; soft bleeding gums. Eats no fruit and very little vegetable.

Case 4.—Male, aged 42; single; admitted July 3, 1937. "Pyorrhoea six months"; bleeding gums; foetor oris marked. Petechiae on legs, ecchymoses on both feet.

Case 5.—Male, aged 70; single; admitted July 5, 1937. Anorexia; spongy bleeding gums; purpuric eruptions on both feet.

Case 6.—Male, aged 64; married; admitted July 26, 1937; Large ecchymoses over whole of left leg for four weeks. Bleeding gums; complete anorexia; hypochromic anaemia.

Case 7.—Male, aged 62; single; admitted July 31, 1937. Ecchymosis both thighs and legs, also left arm; spongy gums. Does not eat any fruit.

Case 8.—Male, aged 51; married; admitted August 9, 1937. Ecchymosis of legs for one month; many petechiae; soft gums; does not eat any fruit or vegetables.

Case 9.—Male, aged 63; widower; admitted August 9, 1937. Purpuric haemorrhages both legs; dyspnoea; angina. Edentulous; gums normal.

Case 10.—Male, aged 77; widower; admitted August 9, 1937. Large ecchymosis of left leg for one month; bleeding gums. Cannot remember when he last ate fruit or vegetables.

Case 11.—Male, aged 56; separated from wife; admitted August 30, 1937. Large ecchymosis on right leg and foot for four months; bleeding gums; no fruit or vegetables for six months.

Case 12.—Male, aged 62; single; admitted October 13, 1937. Haemarthrosis of the knee for one week; many petechiae; ecchymoses both ankles. Edentulous; gums normal. Does not eat fruit.

Case 13.—Male, aged 60; widower; admitted October 17, 1937. Purpuric eruption and ecchymoses on both legs;

marked hypochromic anaemia. Edentulous; gums normal. "Unable to look after himself."

All these patients made complete recoveries on being given large amounts of orange juice, and extensive laboratory investigations were not considered necessary. The following points may be worth noting:

1. The patients are men past middle age who in most cases have no womenfolk to look after them.
2. A history of a vitamin-C-deficient diet can nearly always be obtained.
3. Haemorrhages in the legs, either ecchymoses, purpuric haemorrhages, petechiae, or haemarthroses, are a constant finding.
4. Bleeding, spongy gums are usual, but in the absence of teeth the gums are normal.
5. Anaemia, usually hypochromic, is common.
6. The condition rapidly clears up on giving orange, lemon, or tomato juice.

A further interesting point is that the great majority of patients first come to hospital in the spring and summer months. In 1936 eight cases were admitted: one in January, two each in June and July, and three in August. In 1937 there were three cases in June, four each in July and August, and two in October. So far this year we have had sixteen cases: one in February, one in March, three each in April and May, four in June, one in July, and three in August. Drs. Jennings and Glazebrook's cases first came to hospital in July and in August. The likely reason for this seasonal incidence is that the price of oranges in April and May is about double the average price during the rest of the year.

I have to thank Dr. H. H. MacWilliam, medical superintendent of the Walton Hospital, for permission to record these cases.

—I am, etc.,

Walton Hospital, Liverpool, Oct. 19. A. MARTINEZ.

Sulphanilamide for Filarial Lymphangitis

SIR,—For the past few months I have been using sulphanilamide in cases of filarial lymphangitis due to the *Filaria bancrofti*. The treatment of this disease has always been very unsatisfactory, and in some tropical countries, such as Fiji, the condition is very prevalent and causes many tropical residents lifetime misery and ill-health, often with repulsive deformity.

A typical case was that of a man aged 51, an outdoor worker of regular habits. Since the age of 8 he had been the subject of attacks of filarial lymphangitis. The attacks lasted a week and often occurred every month—rarely was the interval between attacks as long as three months. Of late years his left leg had permanently increased in size (elephantiasis). In a typical attack he would be seized with chills and fever, with anorexia and sometimes vomiting. The left leg would become red, swollen, and very painful, and the lymphatic glands of the left groin would enlarge, becoming painful to the touch and requiring hot fomentations to relieve the pain. The lymphatics would become red and inflamed and visible from knee to groin. These attacks would last about a week.

On the other hand, a typical attack treated with sulphanilamide was as follows: on September 21 his temperature was 102° F., the left leg was red, and the patient suffered from chills and was confined to bed. At 6 p.m. he began taking proseptasine, 7½ grains every four hours. On September 22 at 8 a.m. the temperature was normal; the redness of the left leg had disappeared; there was no pain in the groin from adenitis; and he had a good appetite and was able to walk about. On September 23, after taking altogether eight tablets, he was quite well again.

This shows that sulphanilamide has a direct and rapid therapeutic action in the treatment of filarial lymphangitis, and further investigation should be made of its possibilities in this disease.—I am, etc.,

Fiji, Sept. 23. A. E. BOTSFORD DENOVAN.

The Occipito-posterior Case

SIR,—At the present time there is much thought and discussion regarding the various means by which the standard of obstetrics, as commonly practised, may be raised. It is generally agreed that the education of the medical student is of prime importance in this respect.

With all due regard for the experience of Dr. David Price (*Journal*, September 17, p. 638), I feel that his views are hardly suitable as advice to the student or young practitioner. When using forceps he violates two cardinal principles in that he does not wait for full dilatation of the cervix, nor does he first make an accurate diagnosis of the position of the foetal head.

As resident in various maternity hospitals I have seen several cases sent in as "failed forceps." In five of these the failure was due entirely to disregard of the above rules, not to any other obstetric abnormality. From these cases and others I have gained the impression that many practitioners will attempt any forceps delivery without hesitation, whereas, when confronted with other abnormalities, they realize their limitations and arrange for consultation or removal of the patient to hospital. I would put forth a plea, therefore, for more intensive education of the undergraduate student in the proper understanding and use of the obstetric forceps.—I am, etc.,

St. Michael's Hospital, Toronto, Canada, Oct. 10. B. E. MEEK.

Identical Cancers in Identical Twins

SIR,—Your annotation on this subject (October 8, p. 753) contains a statement which should be contradicted. Surely it is untrue to say that "usually, if a cancer develops in one of a pair of identical twins, the other twin has a cancer of the same type in the corresponding organ, either at the same time or soon afterwards." The exact percentage of cases in which concordant cancers develop will be known, at any rate for Germany, when the data now being submitted to the Kaiser Wilhelm Institute for Anthropology in Berlin are finally analysed. In the meantime Versluys (1934) and Weitz (1936) have adduced evidence that concordant cancer in identical twins is exceptional. Error arises because, as German workers have repeatedly pointed out, twin statistics compiled from random cases in the literature are worthless. Luxenburger (1932), for instance, collecting twins with schizophrenia from the literature, found 82 per cent. concordant. Submitting a questionary to the superintendents of various mental hospitals, he found 56 per cent. concordant; but when he took the trouble to compile a personal series, finding out from the registries which schizophrenic patients were twins, the percentage of concordance dropped to less than 20.

The likelihood of an identical twin developing cancer when the other member of the pair already has it is quite a practical problem, because several hundred such cases occur every year; they are often distressing, and the practitioner responsible needs guidance. But the theoretical side of the question is even more interesting. Roughly, there are three different types of reaction between heredity and environment. In the first group come diseases like haemophilia, which are more or less independent of the

environment: it is characteristic of these cases that they are uncommon, that identical twins always agree provided they live long enough, and that there is, theoretically, a simple mathematical relation between the proportion of non-identical twins which develop the disease concordantly and the proportion which do not. In the second group come diseases, such as disseminated sclerosis, where heredity is completely unimportant and identical twins show no tendency to concordance at all (Thums, 1936). The third group lies midway between these extremes, and includes the majority of common diseases. In this group heredity and environment are both important, the explanation being that if a disease is due to a single predominatingly important environmental factor such as vitamin D shortage or a badly balanced mineral content of the diet, different individuals will vary in their sensitiveness to the harmful factor, and, providing that the deficiency acts fairly evenly on a population, hereditary variations in sensitiveness will determine which individuals are affected and which escape.

Twin material and certain family pedigrees and animal breeding experiments leave little doubt that some cases of cancer fall into the first group of "inevitable" disease. But if allowance is made for the existence of these cancers there is little evidence that heredity plays much part in the general incidence of cancer. That is a depressing conclusion to reach, because if cancer were due to a few simple carcinogenic factors in our environment we should presumably, like the laboratory mouse (Bonser, 1938, and others), show hereditary variations in susceptibility, and heredity would then be as important in cancer as it is in rickets (Lehmann, 1934). In other words, cancer is theoretically an unpromising problem in preventive medicine.—I am, etc.,

Oxford, Oct. 18. DENYS JENNINGS.

REFERENCES

Bonser, G. M. (1938). *J. Path. Bact.*, **46**, 581.
Lehmann, W. (1934). *Mschr. Kinderheilk.*, **62**, 204.
Luxenburger, H. (1932). *Jahresvers. dtsch. Ges. Vererbungswiss.*
Thums, K. (1936). *Z. Neur.*, **155**, 185.
Versluys, L. J. (1934). *Z. Krebsforsch.*, **41**, 239.
Weitz, W. (1936). *Die Vererbung innerer Krankheiten*, Stuttgart.

Sarcoidosis of Boeck

SIR,—It is to be hoped that Dr. R. Bodley Scott's article on the sarcoidosis of Boeck (*Journal*, October 15, p. 777) will succeed in making more widely known a systemic disease first described many years ago by dermatologists (Besnier, Tenneson, Boeck). Besnier (1889) believed it to be caused by the tubercle bacillus, his patient showing "*le plus remarquable exemple de synovite fongueuse symmétrique que l'on puisse observer.*" Boeck suggested in his first paper (1899) that "perhaps, later on, they may be found to represent benign forms of so-called pseudo-leukaemic affections of the skin." It was, however, only in 1915 that the first comprehensive report appeared other than in the dermatological literature. It was written jointly by a dermatologist and a physician on seven cases showing the typical lesions in skin, lungs, and partly also in spleen, kidney, and mucous membranes (Kuznitzky and Bittorf). Although in the following years Jüngling's papers (1920, 1928) did much to make the osseous lesions familiar to radiologists and (from 1920 onwards) several cases were reported in ophthalmological journals, it still remains true that "the disease is not even mentioned in the textbooks of internal medicine" (Salvesen, 1935). Schaumann's important contributions (since 1914) also had long remained unnoticed except by dermatologists, and it is only recently that in more generally accessible journals authoritative articles have been published in which more attention is given to the natural history of the disease and the involvement of internal organs than to its puzzling aetiology (Denmark: Kissmeyer, 1932. Austria: Bergel and Scharff, 1933. France: Pautrier, 1935; Rist, 1937. Sweden: Salvesen, 1935. United States: Longcope and Pierson, 1937. Switzerland: Loeffler, 1937. Holland: Snapper and Pompen, 1938. This list includes only monographs and the first of the more important papers published in these countries).

It is not difficult to add from the recent literature to the case mentioned by Dr. Scott other cases reported as of chronic miliary tuberculosis or tuberculous splenomegaly in which the diagnosis of sarcoidosis would appear to be more probable. In their excellent monograph on chronic miliary tuberculosis Hoyle and Vaizey (1937) have presented a number of cases of sarcoidosis as examples of chronic miliary tuberculosis, although they expressly discuss sarcoidosis in the chapter on differential diagnosis. The tendency to include such cases into the entity of chronic miliary tuberculosis seems to be traceable to the influence of four publications which dealt most exhaustively with the pathology of the condition from a morphological point of view but which seem to have somewhat obscured the actual clinical picture (v. Hansemann, 1915; v. Gebsattel, 1920; Askanazy, 1921; Mylius and Schürmann, 1929–30).

A correct diagnosis is of importance with regard to both prognosis and treatment. Some of those cases which later developed pulmonary tuberculosis may have become infected while being treated for the lesions of sarcoidosis in a sanatorium. I myself know of a patient who died from splenectomy; a fuller appreciation of the significance of the symptoms—generalized glandular enlargement (biopsy: numerous tuberculous cell systems), splenomegaly, and partial facial paresis of some years' standing—could have avoided this issue. Another case with splenomegaly as leading symptom has been reported by Dressler (1938), which has the additional interest that the diagnosis was established by sternal puncture; the patient had refused to permit dissection of a lymph gland or puncture of the spleen.

In recent radiological literature a number of cases of atypical tuberculous bone lesions have been reported in which the diagnosis of sarcoidosis or of osteitis tuberculosa multiplex cystoides has been erroneously made (Van Alstyne and Gowen, 1933; Vastine and Bacon, 1935; Connolly, 1938; Thornton, 1938). It seems no longer justified to retain for one of the signs of sarcoidosis a term which is most probably misleading with regard to the aetiology. While some of these cases would seem to belong to the syndrome of "tuberculous cysts and abscesses of epiphyseal lines," described by Kienböck (1930), a recent paper by Buttinger (1938) gives a good example of unusual "cystoid" bone tuberculosis, which the author properly refrains from classifying under one of the known syndromes.

It would appear that the question of the cause of sarcoidosis will have to be adjourned at least until more (positive or negative) facts are known regarding ultramicroscopical or other forms of the tubercle bacillus. Twenty years ago the finding of Much's granules in sarcoid lesions was reported by several authors, but nobody seems now to attach any significance to these granules. The various findings and hypotheses offered by some authorities as proof of a tuberculous aetiology have recently been presented again by Pinner (1938). No new facts are added by this author, and he does not mention

the many objections brought forward against these hypotheses. Danbolt and Brandt (1938) have described a case of sarcoid-like cutaneous tuberculosis caused by the avian tubercle bacillus, but they do not regard this case as one of the sarcoidosis of Boeck, "as this disease is in our opinion scarcely ever caused by tuberculosis." That "there is no convincing evidence that sarcoidosis is a manifestation of tuberculosis" (Scott, 1938) seems to be the only possible critical attitude to-day.—I am, etc.,

London, S.W.2, Oct. 22. HERBERT LEVY.

REFERENCES

(References are given only for papers not mentioned in Dr. Scott's article.)

Askanazy, M. (1921). *Beitr. path. Anat.*, **69**, 563.
Bergel, A., and Scharff, O. (1933). *Wien. klin. Wschr.*, **46**, 1224.
Buttinger, Th. (1938). *Fortschr. Geb. Roentgenstr.*, **57**, 176.
Connolly, A. E. (1938). *Brit. J. Radiol.*, **11**, 25.
Danbolt, N., and Brandt, A. (1938). *Arch. Derm. Syph.*, Berlin, **178**, 76.
Dressler, M. (1938). *Klin. Wschr.*, **17**, 1467.
v. Gebsattel, E. Frhr. (1920). *Beitr. klin. Tuberk.*, **43**, 1.
v. Hansemann, D. (1915). *Virchows Arch.*, **220**, 311.
Hoyle, Cl., and Vaizey, M. (1937). *Chronic Miliary Tuberculosis*, London.
Jüngling, O. (1928). *Beitr. klin. Chir.*, **143**, 401.
Kienböck, R. (1930). *Arch. Orth. Unf. Chir.*, **29**, 67.
Kuznitzky, E., and Bittorf, A. (1915). *Münch. med. Wschr.*, **62**, 1349.
Loeffler, W. (1937). *Helvet. med. Acta*, **4**, 747.
Mylius, K., and Schürmann, P. (1929–30). *Beitr. klin. Tuberk.*, **73**, 166.
Pinner, M. (1938). *Amer. Rev. Tuberc.*, **37**, 690.
Rist, E. (1937). *Ann. Méd.*, **41**, 169.
Schaumann, J. (1914). *Sur le Lupus Pernio* (Reprint, Stockholm, 1934).
Snapper, I., and Pompen, A. W. M. (1938). *Pseudo-tuberculosis in Man*, Haarlem.
Thornton, W. F. (1938). *Radiology*, **31**, 222.
Van Alstyne, G. S., and Gowen, G. H. (1933). *J. Bone Jt. Surg.*, **15**, 193.
Vastine, J. H., and Bacon, E. P. (1935). *Radiology*, **24**, 22.

Ether Convulsions

SIR,—It appears to me that both carbon dioxide lack and carbon dioxide excess may play their part in the causation of "ether convulsions." It is, of course, true, as Dr. Nosworthy has heroically demonstrated, that gross excess of carbon dioxide in the inspired air will eventually produce convulsions. On the other hand, there is considerable clinical evidence to support the carbon-dioxide-lack hypothesis; for example:

1. Many cases of "ether convulsions" were reported during pure insufflation endotracheal anaesthesia without rebreathing, under which conditions the alveolar carbon dioxide concentration is abnormally low.

2. "Ether convulsions" have many times been stopped by the addition of carbon dioxide to the inspired air.

3. Examination of the urine first passed after an attack has shown a high alkalinity, so that the patient was presumably suffering from alkalosis.

There is no doubt that the subject is a most complex one, and that in the present state of our knowledge we are not competent to explain the mechanism of the causation of this interesting condition.—I am, etc.,

London, N.W.8, Oct. 21. C. LANGTON HEWER.

Adrenaline Treatment of Asthma

SIR,—May I stress two rather unpleasant sequelae of the treatment of asthmatic attacks by adrenaline. First, the employment of adrenaline during a cold in the head, with the patient up and about, is not seldom followed by a very rapid spread of infection to the lower bronchial tract. As attacks of asthma are often more persistent during such infections a larger dosage may be resorted to just at these times. Secondly, in cases in which the dose has been gradually increased up to, say, ½ c.cm. every two or three hours the condition may pass into one of continuous dyspnoea and cyanosis, which is unrelieved by adrenaline alone.

It would be interesting to discover the exact cause of this condition and also the frequency of its occurrence in private practice. Can adrenaline in a toxic dosage produce active pulmonary congestion? Are the symptoms those of early cardiac failure due to repeated overstimulation? Finally, are there patients with whom adrenaline is a true drug of addiction, in the sense of antibody production, and in whom the "anti-hormone" is the real toxic factor?—I am, etc.,

Queen Mary's Hospital, Carshalton, Surrey, Oct. 22. JOAH BATES.

Medical Re-education

SIR,—In your recent Educational Number (September 3) there was a constructive article of remarkable frankness and clear analysis by Sir Walter Langdon-Brown. His information regarding the proceedings of two committees on the medical curriculum was both illuminating and suggestive—illuminating the cause of the relative confusion of opinion regarding the curriculum and suggestive of the beginning of an answer. It seemed as if human wisdom had failed to devise a scheme to which all would subscribe for the training of the men who are to be stewards of the nation's health. The survival value of the Empire itself depends on the integrity of its health, if the word is given its most universal connotation.

In our approach to the subject we need a more fundamental conception of the nature of the problems. Sir Walter's article begins with the student at his entry into the medical school. But already the student (I speak from my own fairly recent experience) has many unsolved personal problems. Now the curriculum makes no provision for dealing with these, and he may finish his course no better equipped in this respect than he was at his entry. In point of fact he has generally added other unsolved problems to his psychological make-up. This is unsatisfactory, for we know that in practice we see patients every day whose illness is influenced, or even caused by, those same fears (as Sir Walter noted), family problems, and other emotional compromises to which the practitioner himself is exposed and for which he may have no answer. An example. Every psychologist of the eclectic school at least, and most general practitioners, will agree that the deepest and commonest problem is security, which gives rise to fear when it is threatened. It may be economic or affectional security that is threatened. He is afraid lest he will not have enough, or because someone does (or did) not love him enough. The security problem is common in our profession. We all know what it means. We have often put our security in our reputation—our reputation in the eyes of the very people who come to us for help. But we cannot release them if we are not free ourselves.

Another problem was quoted by Sir Walter Langdon-Brown, and more recently in another reference by Lord Dawson of Penn in his address at the opening of the new medical school at Aberdeen University. He described how, taking the country as a whole, there had been a gradual growth of medical services and hospitals which,

however individually excellent, had become a medley of separate efforts. This same lack of unity, arising from insistence on a point of view, was expressed in Sir Walter's committees, where everyone agreed on the necessity for pruning the curriculum—at the expense of the other fellow's subject!

The answer seems to consist in attaining a new level of thinking and acting by a change in human nature itself. This is the forgotten factor in medical education. The physician must be healed himself. Or his teachers must see that the medical student is equipped in this respect before he is entrusted with the care of people who are similarly sick. The magnitude of the task is great, involving as it does every member of the profession and every student. But the effort would usher in the next great advance in therapy and research. It would enhance the value of the medical service to the community.

The expression "moral rearmament" has recently been the subject of Press articles and correspondence in the *Times*. It seems to me that this approach to the subject of medical education is part of the moral rearmament that our profession needs, and by which an immense contribution can be given to bringing about a settled state of the world.—I am, etc.,

D. B. Watson, M.B., Ch.B., D.P.M.

London, N.11, Oct. 15.

Prognosis of Anxiety States

Sir,—In the interesting article in the *Journal* of September 24 (p. 649) Dr. Arthur Harris quotes Jones as having established the connexion between the anxiety state and sympathetic activity.

I would like to draw attention to an earlier paper by Dr. Walter Misch (*J. ment. Sci.*, April, 1935, **81**, 389), in which he describes a series of fifty cases of anxiety state treated with acetylcholine.—I am, etc.,

A. M. B. Walker, M.R.C.S., L.R.C.P.

London, W.C.1, Oct. 13.

The Services

NAVAL COMPASSIONATE FUND

At the quarterly meeting of the directors of the Naval Medical Compassionate Fund, held on October 14, Surgeon Vice-Admiral P. T Nicholls, C.B., K.H.P., Medical Director-General of the Navy, in the chair, the sum of £164 was distributed among the several applicants.

DEATHS IN THE SERVICES

Lieutenant-Colonel Arthur Rowland Greenwood, R.A.M.C. (ret.), died at Bexhill-on-Sea on October 11, aged 64. He was born on January 19, 1874, was educated at Middlesex Hospital, and, after taking the M.R.C.S.Eng. and L.R.C.P. Lond. in 1897, entered the Royal Army Medical Corps as lieutenant on June 21, 1900. He became lieutenant-colonel on January 26, 1917, and retired on June 26, 1924. He served in the war of 1914–18, and was mentioned in dispatches in the *London Gazette* of February 17, 1915. He had been a member of the British Medical Association for twenty-one years.

Captain John Joseph Cedric Rainsbury, R.A.M.C., died on August 13. He was educated at Sheffield University, where he graduated M.B., Ch.B. in 1932. After filling the posts of house-surgeon at the Jessop Hospital for Women and of house-surgeon and ophthalmic house-surgeon at Sheffield Royal Hospital he entered the Royal Army Medical Corps on January 1, 1935, and had recently been placed on temporary half-pay on account of ill-health.

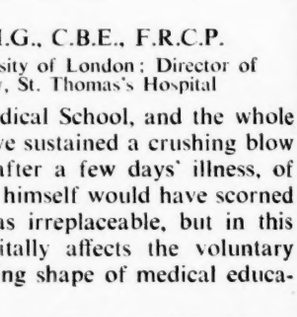
Obituary

L. S. DUDGEON, C.M.G., C.B.E., F.R.C.P.

Professor of Pathology, University of London; Director of Pathology and Bacteriology, St. Thomas's Hospital

St. Thomas's Hospital, the Medical School, and the whole cause of medical education have sustained a crushing blow in the death on October 22, after a few days' illness, of Leonard Stanley Dudgeon; he himself would have scorned the suggestion that anyone was irreplaceable, but in this period of transition which vitally affects the voluntary hospital system and the changing shape of medical education the loss is irreparable.

Dudgeon joined St. Thomas's in 1894; in 1899–1900 he was assistant house-physician and house-physician; he obtained the Membership of the Royal College of Physicians in 1901 and was elected Fellow in 1908. Soon after qualification he became associated with Louis Jenner and was greatly influenced by Professor Shattock—association and influence which led him to become one of the early workers in bacteriology and pathology as specialized subjects. All through his career he set for himself an exceptionally high standard: he quoted Professor Shattock as one who served pathology well in preventing acceptance as fact of work which was non-proven: Dudgeon did not publish the results of his research work until, in his own mind, he was satisfied that his findings were sound and founded on fact. An astoundingly accurate memory was one of his great assets: his opinion and reasoned advice on any subject connected with the hospital were ever at the disposal of his colleagues: his sound judgment made him an invaluable committeeman.



As Dean of the Medical School Dudgeon attended to every detail, and held the full confidence of the staff and lay body. During his deanship the Anatomy Department has been rebuilt; the Library, the Department of Chemistry, and the Sherrington School of Physiology have been largely transformed; and thanks to the generosity of his friends, Mr. Michael and Sir Sidney Herbert, an Institute of Research has been built on the roof of the Medical School. He was an excellent teacher: he enjoyed teaching, and instilled his own enthusiasm into those he taught. A good tactician, he was an exponent of "letting the other fellow talk": he had the gift of so organizing his time that he found—made—time for everything, and was a supreme example of a favourite adage, "It is only the busy man who has time for everything." Whatever other calls were made upon him, he invariably placed first his engagements in the hospital and medical school, and however inconvenient the time or distance he was always at the disposal of his colleagues and friends who needed his help, personal or professional. His academic distinctions included the Croonian, Horace Dobell, and Erasmus Wilson Lectureships, but his bent was more practical than academic.

In 1903 Dudgeon was appointed Superintendent of the Clinical Laboratory of St. Thomas's Hospital; in 1905

Director of Pathological Laboratories and Bacteriologist; in 1927 Curator of the Shattock Museum. He held a University of London Professorship in Pathology. In 1915 he put aside his appointments and practice and served with great distinction as Colonel A.M.S., Consulting Bacteriologist in Salonika and the Eastern Mediterranean. He was mentioned in dispatches three times, and was awarded the C.M.G. and C.B.E. At the Special Clinical and Scientific Meeting held by the British Medical Association in April, 1919, to discuss problems arising out of the war, he read the opening paper on "The Dysenteries: Bacillary and Amoebic." In 1928 he succeeded Sir Cuthbert Wallace as Dean of the Medical School of St. Thomas's, and for the last ten years played a most important part in the organization and administration of the Voluntary Hospitals Committee; he was chairman of the Deans Committee, a member of the Senate of the University of London, and was a leading figure in early teaching co-operation between the medical schools and the L.C.C. hospitals, rendering great service during the stage of re-adjustment through which the voluntary hospitals and medical schools are passing.

Dudgeon not only studied under Shattock, he studied Shattock, and, as part of the pathologist's outfit, assumed the somewhat brusque mannerisms of the shy, lonely man who was Shattock. Brusqueness was no natural characteristic of Dudgeon; he was a man brimful of humanity and innate kindness, though such a description of himself would have annoyed him intensely. He suffered not gladly those whom he regarded as fools, but he had high ideals of justice, and some of his kindest actions, known only to those who were in his confidence, benefited people whom he had little cause to like but for whom he was sorry. A devoted family man, he had great zest in life; he enjoyed dining out, the company of his fellow-men; and he took a lively interest in outdoor games. He was a contented golfer, a former captain of Beaconsfield Golf Club, and he seldom missed a big match at Twickenham or notable athletic meetings. He was the staunchest of friends to those whom he regarded as friends: he had extraordinarily high ideals in his devotion to his work and whatever he took in hand: he holds high place indeed among those who, during the eight hundred years of the hospital's history, have given the best of their lives to St. Thomas's.

R. J. C. T.

By the death on August 29 last, at the age of 89, of Charles Walter Evans, at his residence, Matlock House, Bakewell, Derbyshire loses its oldest medical practitioner and the profession another of the old school of respected family physicians. A full obituary notice appeared in the *High Peak News* of September 3, 1938, which set out his local interests and activities over many years. He was born on January 19, 1849, at Winster, and was the eldest son of Charles Evans, F.R.C.S.Eng., who practised there, the family being a very old Derbyshire family, and also connected with Florence Nightingale. At the age of 3 he went to Bakewell with his father, who had purchased a practice there. He was educated at Derby Grammar School, where he obtained a first class in the London matriculation examination, afterwards studying at University College, London, where he obtained his L.S.A. and M.R.C.S.Eng. in 1876 and M.B.Lond. in 1878. He was apprenticed to Dr. Lomas of Belper before qualification, as was the old custom. Subsequently he held the appointments of house-surgeon to the South London Eye Hospital, the Shrewsbury Eye, Ear, and Throat Hospital, the Warneford Hospital, Leamington, and Gloucester Infirmary. He was assistant medical officer to the Kent County Lunatic Asylum and Three Counties Asylum, Bedfordshire. For a time he was acting medical officer, North-West District of Chelsea and No. 5 District of London. He was also acting medical officer and public vaccinator, Martley Union, Upton-on-Severn, Worcestershire, and visiting surgeon to the Hospital for Sick Children, Cheltenham. Dr. Evans finally settled down at Bakewell in 1886 on the death of his father, and succeeded him as medical officer of the Bakewell Union Infirmary, a post he held for forty-two years, retiring in 1928, when his son was appointed. He was M.O.H. to the Bakewell Urban District Council for over forty years, held the posts of certifying factory surgeon and school medical officer, and was physician to the Bakewell Dispensary for a long time. He was interested in the foundation of the Bakewell War Memorial Cottage Hospital, and was on the original committee. He had been a member of the Derbyshire Panel Committee for many years, and joined the British Medical Association as long ago as 1877. He had been in failing health during his latter years. He married in 1896 Cornelia Florence Handley Lawton of Manchester, who predeceased him, and is survived by his three sons and two daughters.

We regret to announce the death on September 28 of Dr. Ernest Bonney of Kensington, third son of the late Dr. W. A. Bonney of Chelsea. Dr. Bonney was born in 1875, and received his medical education at Charing Cross Hospital. He did brilliantly in the school, taking a number of prizes, and he subsequently held the posts of house-surgeon and house-physician. After a period as house-physician at the Victoria Hospital for Children, Dr. Bonney was appointed resident medical officer at the Kensington Children's Hospital, a post he retained for a number of years, during which time he acquired a considerable knowledge of children's diseases. He became so popular in the neighbourhood that when he retired to take up general practice a public presentation was made to him. Dr. Bonney possessed great ability and was extremely conscientious in his work, never sparing himself in his efforts to do the best for his patients; indeed, he may be said to have worn himself out in their service. He was a man of very varied activities and knowledge, exceedingly well read, especially in matters relating to history, art, and music, and a good singer, a gift which he inherited from his father. He was young both in body and spirit, and the profession is the poorer for his passing. He leaves behind him a widow and a son and a daughter, the former of whom is following his father's steps in the medical profession.

Mr. Francis Charles Abbott, who died in London on October 6, had lived for some years at The Hermitage, Bletchingley, Surrey. He was born in 1867 the second son of the Rev. R. A. Abbott, and after schooldays at Bruce Castle entered St. Thomas's Hospital, where he won the Cheselden medal and treasurer's gold medal and a university exhibition and gold medal in anatomy and organic chemistry. After taking the M.R.C.S. and L.R.C.P. diplomas in 1888 he graduated M.B.Lond., with gold medal in obstetric medicine, and B.S. in 1890; and at the M.S. examination three years later he qualified for gold medal, having already become F.R.C.S.Eng. He was appointed assistant surgeon, aural surgeon, and lecturer on practical and operative surgery at St. Thomas's, and surgeon to the Evelina Hospital for Sick Children. During the Greco-Turkish War of 1897 Mr. Abbott served as chief medical officer to the National Fund for the Greek wounded, and received a decoration. For his war work in 1914–18, as surgeon-in-charge of Red Gables Hospital, he was awarded the C.B.E. He had been vice-president of the Chelsea Clinical Society and belonged to the British Medical Association for fifty years.

Dr. John Wilfred Bird, D.S.O., who died at Egham, Surrey, on October 17, aged 66, was a student at Guy's Hospital and qualified M.R.C.S., L.R.C.P. in 1896. After serving as house-surgeon at the Hull Royal Infirmary and clinical assistant at the Royal London Ophthalmic Hospital and the Central London Ophthalmic Hospital, he entered

the Royal Navy, retiring at the end of eight years. He then took up general practice, and became medical officer to the Egham Cottage Hospital and the Windsor Union Infirmary, and police surgeon for the Egham Division. In 1914 he volunteered for foreign service, and held the posts of officer commanding the 2/6 London Field Ambulance and 71st General Hospital, with the rank of lieutenant-colonel R.A.M.C.T. He was mentioned in dispatches for his services in France, Macedonia, Egypt, and Palestine, and received the D.S.O. After the war Dr. Bird was a member of the Egham Urban District Council for eleven years and chairman for three. He had been a member of the Guildford Division of the British Medical Association since 1921.

The death has occurred at the French army hospital, Val-de-Grâce, after a short illness, of Surgeon General MAURICE CARAYON at the age of 57. His administrative gifts secured his rapid promotion during the great war, when he was attached to headquarters. In March, 1936, he was appointed surgeon general, and since then he had been in charge of the army medical service in the Amiens area.

Professor O. CROUZON, who died recently, was born in Paris in 1874, and was the first to be appointed to the new chair of medico-social aid at the University of Paris. He did much to raise the standard of nursing in France, and contributed important studies on neurological and psychiatric subjects.

EPIDEMIOLOGICAL NOTES*

Acute Poliomyelitis

Rather unexpectedly the incidence of acute poliomyelitis has risen in England and Wales in the course of the last two weeks. Being a disease of hot climates, and in all countries most common during the hot months, a reduction in the incidence was confidently expected to accompany the fall of air temperature observed at the approach of winter. Of the 77 (65) cases notified in England and Wales, 12 (2) were in Oxfordshire, 11 (9) in Essex, and 7 (1) in Leicestershire. Last week the three counties chiefly affected were Essex, Carmarthen, and Lancashire. Other areas affected to a less degree were: Sussex East, 6 (3), 4 each in Carmarthen (6), Glamorgan (2), and London (6)—Fulham, Hackney, Shoreditch, Camberwell —and 3 each in Chester (2), Gloucestershire (0), Lincoln (2), Southampton (2). More than one case was reported from the following centres: Oxford 11, Leicester 7, Harwich 7, Cuckfield 6, 3 each in Stamford and Tendring, 3 each in Chester, Bristol, Middlesbrough, Cardiff, Llanelly Rural. Between July 17 and October 8, when the seasonal increase was first noticed, 806 cases were recorded for England and Wales: of these 135 cases occurred in Essex, 60 in London, 64 in Yorkshire, 54 in Lincoln, 48 in Sussex, and 34 at Swansea. Of the 6 cases notified in Scotland, 2 were in Dunfermline, 1 each in Glasgow, Inverness Borough, Inverness County, and Kirkcaldy.

In Germany during the week ended October 1, cases declined from 375 to 337—the chief centres affected were the following: Cologne district 28 (44), Bavaria 54, Wiesbaden 26, Düsseldorf 21, Württemberg 54, Saxony 27, Hessen 19, Austria 26. In Holland 32 (44) cases were reported during the week ended October 8, 12 (18) of which occurred in the Province of South Holland.

Enteric Fever

During the week under review there was an increase in the incidence of enteric fever in England and Wales—32 (24) —in which London shared—11 (5). Two-thirds of the cases occurred in the counties of Lancashire and London. In Lancashire there were 10 (2) cases, distributed thus: Eccles 4, and 1 each in Crosby, Manchester, Bolton, Urmston, Wardle, and Ashton-in-Makerfield; in London the 11 cases were in Kensington 3, Woolwich 3, Westminster 2, and Hammersmith, St. Pancras, and Stepney 1 each: last week the 5 cases occurred in Fulham, Kensington, Paddington, Wandsworth, and St. Marylebone.

Primary and Influenzal Pneumonia

A further increase in the notifications of primary and influenzal pneumonia was recorded in England and Wales during the week under review—483, compared with 453 in the previous week—but in London there was a decrease—38 (47). The counties with the greatest increases were: Derby 17 (12), Durham 26 (19), Lancashire 92 (70), Middlesex 18 (11), Warwickshire 38 (35). The number of deaths fell considerably in the 126 Great Towns of England and Wales (from 22 to 12), while in London they remained at 2.

Diphtheria and Scarlet Fever

There was a rise in the notifications of diphtheria in England and Wales and in London during the week under review—1,288 (1,166) and 138 (125) respectively. The centres chiefly affected were: Plymouth 15 (10), South Shields 28 (18), Easington 27 (17), Liverpool 65 (16), Manchester 32 (17), Battersea 9 (1), Fulham 8 (1), St. Pancras 9 (6), Tottenham 7 (2), Uxbridge 8 (0), Croydon 12 (7), Bradford 13 (5), Doncaster 10 (2), Leeds 28 (19), Sheffield 30 (14), Swansea 8 (4). In Scotland, also, an increase was recorded: Glasgow 72 (71), West Lothian 15 (8), Edinburgh 12 (19), Aberdeen 13 (9), Lanark County 10 (10). Of the 27 deaths in the 126 Great Towns of England and Wales 3 occurred in Leeds, and 2 each in Harrow, Liverpool, Birmingham. There were 5 (4) deaths from diphtheria in the 16 principal towns of Scotland during the week—2 each in Glasgow and Ayr and 1 in Paisley.

Notifications of scarlet fever in England and Wales and in London rose during the week under review—1,942 (1,734) and 186 (180) respectively; the centres in which the chief increases were recorded are: Stockport 11 (4), Plymouth 11 (2), East Ham 10 (5), Bristol 29 (23), Bexley 6 (0), Liverpool 42 (35), Battersea 10 (5), Bethnal Green 19 (12), Poplar 12 (5), Ealing 8 (4), Newcastle 21 (13), Wolverhampton 16 (4), Merton and Morden 10 (1), Birmingham 48 (31), Middlesbrough 19 (7), Swansea 11 (2). There was one death (in Carlisle) from scarlet fever in the 126 Great Towns during the week. In Scotland the notifications fell from 389 to 355 during the week under review; 1 death—in Paisley—was reported from the 16 principal towns.

Measles and Whooping-cough

There were no deaths from measles in the 126 Great Towns of England and Wales during the week. Of the 26 (24) cases of measles notified in the administrative county of London the chief were in Hackney 4, Wandsworth and Greenwich 3 each, Kensington, Fulham, St. Pancras, Bethnal Green, and Lambeth 2 each. In Scotland the notifications fell from 17 to 8 during the week under review, with no deaths. Of the 3 deaths from whooping-cough in the 126 Great Towns, 1 each occurred in Bradford, Birmingham, and Ipswich. In London 70 (43) cases were notified, distributed mainly as follows: Islington 10, Stepney 9, Lambeth 6, Poplar 5, Camberwell, Deptford, and Battersea 4 each. In Scotland there was a drop in the notifications from 109 to 91 in the week under review; no deaths were recorded.

Cholera: Plague

During the week ended October 15 there were 361 (280) cases of cholera and 161 (135) deaths in the United Provinces of India and 1,455 (1,670) cases and 702 (743) deaths in the Central Provinces; in Bombay Presidency 381 (267) cases were reported and 161 (95) deaths. In China during the same week there were 82 (95) cases and 24 (33) deaths in Shanghai, and 16 (9) cases and 7 (6) deaths in Hong Kong.

In India during the week under review there were 144 (46) cases of plague and 18 (4) deaths reported in the Central Provinces, 33 (37) cases and 26 (31) deaths in Burma, 30 (23) cases and 12 (12) deaths in Madras Presidency, and 13 (12) cases and 4 (8) deaths in Bombay Presidency.

* Except where otherwise mentioned, figures in parentheses refer to the week preceding the one under review.

No. 41

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 15, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (124 in 1937) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1929-37 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	18	4	2	—	—	14	1	5	1	—		
Deaths		2	1				—	—				
Diphtheria	1,288	138	222	51	35	1,566	199	280	61	40	1,290	229
Deaths	27	5	5	2	—	29	3	3	4	1		
Dysentery	49	13	14		—	37	17	25		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	4	—	1		—	3	—	—		—		
Deaths		—					1					
Enteric (typhoid and paratyphoid) fever	32	11	3	15	3	31	1	12	6	1	46	
Deaths	3	1	1	—	—	2	1	—	1	—		
Erysipelas			63	8	3			84	3	7		
Deaths		1					—					
Infective enteritis or diarrhoea under 2 years												
Deaths	54	14	18	11	1	51	12	20	10	5		
Measles		26	8		1			88		6		
Deaths	—	—	—	—	—	4	—	—	—	—		
Ophthalmia neonatorum	96	15	32		—	100	10	27		—		
Deaths												
Pneumonia, influenzal ‡	483	38	3	1	7	747	79	7	—	2	661	66
Deaths (from Influenza)	12	2	1	—	1	21	5	4	2	1		
Pneumonia, primary			161	5				223	10			
Deaths		9		10	6		24		12	14		
Polio-encephalitis, acute	8	1				3	—					
Deaths		—					—					
Poliomyelitis, acute	77	4	6	—	—	32	7	1	1	—		
Deaths		1					1					
Puerperal fever	5*	5	11	1	—	1	1	12	4	—		
Deaths		—					—					
Puerperal pyrexia	156	10	16		—	169	12	35		3		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths												
Scarlet fever	1,942	186	355	68	80	2,474	161	554	106	91	2,475	342
Deaths	1	—	1	—	—	3	—	—	—	1		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		70	91		13†			36		5		
Deaths	3	—	—	—	—	5	2	1	—	1		
Deaths (0-1 year)	282	43	66	32	10	304	47	76	34	20		
Infant mortality rate (per 1,000 live births)	47	35				51	39					
Deaths (excluding stillbirths)	4,196	745	623	172	119	4,024	771	612	178	144		
Annual death rate (per 1,000 persons living)	10.3	9.5	12.7	11.6	10.5	9.9	9.7	12.5	12.1	12.8		
Live births	6,460	1,237	892	357	247	6,337	1,199	865	456	233		
Annual rate per 1,000 persons living	15.9	15.8	18.2	24.2	21.9	15.7	15.1	17.7	31.1	20.7		
Stillbirths	286	48				245	49					
Rate per 1,000 total births (including stillborn)	42	37				37	39					

* After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

† All in Belfast.

‡ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Universities and Colleges

UNIVERSITY OF OXFORD

The Board of Management has elected C. W. M. Whitty, B.M. (Brasenose College), to the Theodore Williams Scholarship in Pathology, 1938.

In Congregation on October 18 the degree of M.A. was conferred by decree upon Edward Stephens Duthie, M.B., M.Sc., Ph.D.Dub., May Reader in Medicine and university demonstrator and lecturer in pathology.

UNIVERSITY OF CAMBRIDGE

The Council of the Senate has appointed Professor E. D. Adrian, M.D., F.R.S., a governor of the Darwin Trust until July 30, 1942.

A series of lectures on problems related to the biology and chemistry of food preservation will be given at the Low Temperature Research Station at 5 p.m. each Wednesday from November 2 to November 30.

A public lecture will be given in the lecture theatre of the Physiological Laboratory on Thursday, November 3, at 5 p.m., by Professor Otto Loewi, formerly of the University of Graz. Subject: Action and Discovering of Drugs.

UNIVERSITY OF LONDON

At a meeting of the Senate, held on October 19, the title of Professor in Dental Surgery was conferred on W. E. Herbert, M.R.C.S., L.D.S., in respect of the post held by him at Guy's Hospital Medical School.

The Chester Beatty Scholarship in Radiology of the value of £400 for one year has been awarded to E. P. Allen, M.B., Ch.B. This scholarship was established through the generosity of Mr. A. Chester Beatty for two years to enable students to study radiology in the United States.

The John Marshall Fellowship of the value of £500 a year for two years was awarded to K. C. Eden, M.B., B.S., F.R.C.S. This fellowship was established under the will of the late Miss A. B. Marshall in memory of her father, Professor John Marshall.

King's College

It has been arranged for Dr. A. Dalcq, professor of anatomy in the Université Libre de Bruxelles, to give a further lecture on "The Formation of the Pronephros and its Causes" at King's College, Strand, W.C., on Thursday, November 10. This lecture is in addition to the one announced in this column on October 8, which will be delivered on November 8.

UNIVERSITY OF LEEDS

On October 19 the Court decided to confer the following honorary degrees on January 17, 1939, when the new Chancellor of the University, the Duke of Devonshire, will be installed:

LL.D.—Sir James Baillie, ex-Vice-Chancellor of the University of Leeds.

D.Sc.—Dr. J. S. B. Stopford, F.R.S., Vice-Chancellor of the University of Manchester; Sir John Ledingham, F.R.S., director of the Lister Institute.

At a meeting of the University Council Mr. P. J. Moir was appointed Professor of Clinical Surgery, in succession to Mr. L. R. Braithwaite, resigned.

UNIVERSITY OF MANCHESTER

Dr. J. C. Brundret has been appointed assistant lecturer in bacteriology, and Dr. S. G. Abelson chief medical assistant in the Department of Clinical Investigations and Research in succession to Dr. Benjamin Portnoy, who has resigned.

The following candidates have been approved at the examination indicated:

Diploma in Public Health.—J. S. Parkinson, Helen E. Smith, R. C. Webster.

UNIVERSITY OF WALES

Welsh National School of Medicine

The following candidates for the degrees of M.B., B.Ch. have satisfied the examiners in the subject indicated:

Hygiene.—J. M. Bowen, Mary W. Bowen, *Marjorie E. Bright, C. Davies, *G. R. Davies, G. C. D. Evans, D. B. E. Foster, W. H. Harris, J. C. Herapath, G. E. Hosking, H. R. Hudd, Elizabeth G. Jenkins, H. V. Jones, *C. W. D. Lewis, *G. O. Lewis, Mair Llewelyn, *R. M. Marshall, C. J. Morgan, Margaret Morgan, Josephine Parnell, Margaret Parry, J. L. Rees, C. Thomas, Margaret R. Wade, Llary M. Williams, W. Williams.

* With distinction.

The following candidates have satisfied the examiners at the examination indicated:

Diploma in Public Health.—*Part II:* R. M. Dykes, E. W. Kinsey.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh held on October 18, with Mr. W. J. Stuart, President, in the chair, the following, having passed the requisite examinations, were admitted Fellows:

A. D. Popat, R. L. Allan, A. T. Andreasen, J. G. Barrett, H. J. Beard, I. N. Blusger, S. C. Bose, W. D. A. Callam, E. D. O. Campbell, C. W. S. Dun, G. B. W. Fisher, E. Flatow, H. F. P. Grafton, R. W. W. Hardie, C. C. Harvey, A. E. Jowett, O. C. Lord, R. I. Mahadevan, G. J. H. Maud, J. S. Maxwell, P. T. Millard, W. J. Moody, M. L. Pan, F. Rahman, M. V. Ramanamurti, D. E. Stephens, S. L. Swartz, J. H. Symington, R. K. K. V. Tampan, R. K. A. van Someren, J. S. Visser, J. L. D. Williams.

At the annual meeting of the College, held on October 19, the following officers were elected for the ensuing year:

President, Mr. W. J. Stuart. *Vice-President*, Mr. Henry Wade. *Secretary and Treasurer*, Mr. J. W. Struthers. *Representative on the General Medical Council*, Mr. Alex. Miles. *Convener of Museum Committee*, Dr. A. Logan Turner. *Librarian*, Mr. S. M. Traquair. *Conservator of Museum*, Mr. C. F. W. Illingworth.

Medical News

The hundredth dinner of the Aberdeen University Club, London, will be held at the Café Royal on November 17. Any graduates wishing to attend should apply to Dr. Andrew Topping, County Hall, S.E.1.

A sessional meeting of the Royal Sanitary Institute will be held at the Dorothy Café, Sidney Street, Cambridge, on Friday, November 4, at 5 p.m., when Dr. R. D. Tompkins will give an address on "Recent Work in Food Preservation," and a discussion on "The Prevention of Droplet Infection, with Special Reference to Streptococcal Disease" will be opened by Dr. W. H. Bradley.

Owing to the recent international crisis, the meetings of several medical societies in France have been postponed (see *Journal*, October 22, p. 872). The forty-seventh Congress of French Surgery, which was to have been held in Paris in the first week of October, has been deferred to a later date.

Owing to the crisis the second International Congress of Radio-aesthesis, which was to have been held in Paris from October 17 to 19, has been postponed to November 7 to 9. Further information can be obtained from the Secretariat, 9 rue Etex, Paris 18e.

The French Academy of Medicine is prepared to award a prize of 10,000 francs for an original study of the therapeutic properties of olive oil. Entrants for this competition must either give an account of a new curative action on the part of this oil or throw new light on its already known therapeutic properties.

The September issue of the *Bulletin de l'Office International d'Hygiène Publique* includes articles on female employees and tuberculosis in Yugoslavia, renal tuberculosis, tuberculosis in India, standard methods for the preparation of tuberculin, anti-tuberculous vaccine, and immunization against yellow fever.

The October issue of the *British Journal of Dermatology and Syphilis* is a jubilee number (1888–1938) containing retrospective articles by Dr. J. M. H. Macleod, Dr. James H. Sequeira, and Sir Ernest Graham-Little, with portraits of editors of the journal and of celebrated British dermatologists of the past fifty years.

As we go to press we learn with deep regret that Sir Robert Johnstone, who presided over last year's Annual Meeting of the British Medical Association, died at Newcastle, County Down, on October 26.

At the general meeting of the Governors of The Retreat, York, Dr. Arthur Pool was appointed medical superintendent in place of Dr. Neil Macleod, whose resignation was regretfully accepted a few months ago. Dr. Pool for the past five years has been medical superintendent of the South Yorkshire Mental Hospital at Sheffield.

Dr. C. S. Myers, F.R.S., successively Director and Principal of the National Institute of Industrial Psychology since its foundation in 1921, retired from the active direction of its work on October 1. He has, however, accepted the honorary post of its scientific adviser, which will maintain his past contact with the scientific aspects of the industrial and vocational work, and in which he will continue to supervise its research activities and publications.

Dr. L. Haden Guest, M.P., left London for Lagos on October 19 with other members of the Commission which is to report on the interrelationship between Government officials, traders, and natives in the West African Colonies and the general development of resources.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

The Telephone Number of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The Telegraphic Addresses are

EDITOR OF THE *BRITISH MEDICAL JOURNAL, Aitiology Westcent, London.*

SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

Intratracheal Adrenaline for Relief of Asthma

Dr. S. H. Kutar (London, S.E.18) wishes to know if other readers have tried intratracheal instillation of adrenaline for "hyperacute" cases of asthma, and with what results. He has used this treatment in a very small number of cases with great relief of symptoms and without misadventure. The patients in question are those with much respiratory distress, fighting for breath and gradually becoming more cyanosed, and unrelieved by ordinary measures, even morphine. After preparation of the skin of the lower half of the neck a 5 c.cm. all-glass syringe, with a fairly wide-bored needle, is loaded with 2 c.cm. of 1 in 1,000 adrenaline solution. A point is chosen in the mid-line of the neck about a quarter of an inch below the cricoid cartilage, and the detached needle is inserted at right angles to the anterior plane of the neck, entering the trachea between its first and second rings. The loss of resistance and the peculiar sound of air rushing in and out of the needle indicate that the trachea has been entered. After making sure that no blood emerges from the needle, the syringe is mounted on it and the solution injected quickly. Syringe and needle are at once withdrawn and the puncture is sealed with collodion. The spasm of coughing soon subsides, and within two minutes of injection the breathlessness and distress disappear.

Gangrene of the Colon in an Infant

Dr. L. A. Ledingham (Kirkcaldy) writes: Perhaps the following rather unusual case may be of interest to your readers. The patient was a full-time 8½ lb. male, a lusty infant which had been delivered rapidly and spontaneously. It was breast-fed, and did well, apart from a little regurgitation after feeds, for four or five days, after which time it was reported to be feeding badly in spite of a superabundance of breast milk, and to be rather fretful. By the seventh day the infant had lost 2 lb. of its original birth weight. From the fifth day the abdomen had been rather distended, especially in the hypogastric region, and the stools assumed a very slight greenish tinge and were rather loose. There was no sickness, and examination revealed nothing else abnormal. The child lost weight rapidly and died on the eleventh day. At necropsy the abdominal distension was found to be due entirely to the large bowel, which for some unknown reason was greatly distended and full of practically normal faeces. There was at the hepatic flexure a patch of well-marked gangrene the size of a sixpence, with a small perforation; there was peritonitis involving the paracolic gutter, caecum, appendix, and pelvic organs, with a fair amount of turbid free fluid. The abdominal organs were otherwise macroscopically normal, and the chest contents, apart from a defective closure of the ductus arteriosus, were healthy. I should value any opinions as to the possible causation of this condition and the treatment which might be undertaken in such a case.

Treatment of Pruritus Ani

Dr. C. Horwitz (London, N.1) writes: I think "J. M." will find that a cure can be brought about easily and rapidly by methods much simpler than those he has employed and proposes to employ. The patient should be instructed to avoid toilet paper, and make use instead of a small soft sponge which has been wrung out in a mild disinfectant such as dettol (1 drachm to a pint of water). The sponge should be thoroughly cleaned and the water changed every second day. The occasional use of toilet paper when the patient is away from home cannot be avoided and does not seem to matter much.

"J. C." writes: Has "J. M." tried "belzema" ointment and soap (sold by Brooks and Warburton, Ltd., 232, Vauxhall Bridge Road, S.W.1)? An extreme case, the worst I have seen, resisting the usual treatment, including *x*-ray therapy, cleared up entirely on treatment with this soap and ointment.

"A. G." also writes: If "J. M." has not included ung. metallorum in his "innumerable local applications" for pruritus ani, he should try it.

Income Tax

"Back Duty" Paid—Allowances Due

"D." entered into a partnership in August, 1932. His partner was negotiating a "back duty" settlement, and for some years income tax payments were made "on account" with apparently a subsequent lump-sum payment in settlement of all tax to 1936–7 inclusive. "D." now finds that some life assurance relief was not allowed for in the settlement, and neither was the fact that his wife was receiving £52 per annum from the firm for assisting in violet-ray, etc., treatment. The inspector declines to reopen the settlement.

*** It is possible that the terms of the settlement were final and binding, and therefore that "D." has no *legal* remedy. But we advise him not to leave the matter as it stands. The settlement was negotiated on the basis of certain figures and certain definite allowances. If these have now proved unfair to "D." we think the settlement might be reopened, if not as regards both questions at least as regards the life assurance relief, which can be claimed within six years of the end of the year of assessment concerned. The deduction for the £52 is on a somewhat different footing, as it relates to the computation of the profits and there may have been some give and take over those figures when the settlement was agreed. We advise our correspondent to write, placing the facts before the Secretary, Board of Inland Revenue, Somerset House, W.C.2.

LETTERS, NOTES, ETC.

Spontaneous Version of Transverse Presentation

Dr. A. FRANKLIN (Liverpool) writes: About three weeks ago I was approached by a midwife and asked whether I would visit a patient of hers and give an opinion on her condition. On arriving at the patient's home I found that she was in bed and was informed that the membranes had ruptured naturally at 11 a.m. the same day. The baby was lying with its head in the left iliac fossa and the breech in the right iliac fossa; the foetal heart was distinctly audible below and to the left of the umbilicus. On vaginal examination the os was rigid and rather less than two fingers dilated, and protruding through it into the vagina was the right hand of the baby. I decided to perform internal version and bring down a leg. On returning a short time later prepared to do this, I was surprised to find that version had occurred spontaneously, the position being that of a breech. The woman had had no pains. The head was now lying in the fundus, and on vaginal examination the hand had completely disappeared and the breech was easily recognized. The degree of dilatation of the cervix was still the same as before. Pains began about midnight, the presentation being that of a breech with extended legs. The baby was born alive at 5.15 a.m. and weighed exactly 8 lb. The case appears to be unusual, as spontaneous version occurred after rupture of the membranes and prolapse of the arm.

Acute Spreading Emphysematous Gangrene

Dr. T. J. KILGALLEN (Boyle, Eire) writes: There may be nothing very atypical about this case, but the condition is so rare, at any rate in the West of Ireland, that a report of it may be of interest. The patient, a robust woman aged 43, had been ill for ten days, during which period she complained of a "swelling" and severe pain in the right side. When I saw her she had a temperature of 103.5° F. and a pulse rate of 110. Her tongue was very dry and dirty and her respirations were fast; she was cyanosed and appeared to be suffering from a profound toxaemia. On examination there was a tumour about the size of a half-melon on the right chest in the posterior axillary line. This was tympanitic on percussion, and evidently contained gas and a small amount of fluid. There was a brawny swelling extending downwards, involving the tissues of the right loin and hip, and upwards, invading the tissues of the shoulder and chest wall as high as the clavicle. The skin over the swelling was a dusky red colour. On palpation the typical crepitations of emphysema could be felt in parts, but especially over the upper chest. Aspiration of the tumour confirmed that it contained gas and a small amount of very foul-smelling dark grey fluid. The lungs and pleura were normal. I much regret that, owing to lack of convenient laboratory facilities, the fluid had not been examined with a view to isolating the causative organism. Apparently this organism entered the chest wall through an unnoticed scratch or abrasion. I felt that treatment of any kind would be of no avail. The patient died four days later.

Children Alone in the Dark

The annual report for 1937–8 of the National Society for the Prevention of Cruelty to Children draws attention to the growing tendency of parents to leave young children alone in houses for many hours, especially at night. This practice may be attributed to changing social conditions. Contributory factors are the lure of the cinema and other amusements, the difficulty of securing domestic servants, and the increasing number of families where parents live with their children without the company of other adults. As a result of old age pensions and the larger number of houses available grandparents, who formerly lived with their descendants, nowadays are able to keep up separate establishments. The report stresses the mental cruelty inflicted upon a young child who wakes alone in a dark deserted house, and points out that profound and prolonged after-effects may supervene. Distressing tragedies may also occur. In the course of the year under review four young children were burned to death at Gravesend during their parents' absence and three at Dunston-on-Tyne. The inspectors of the Society have been uniformly successful in dealing with the parents in these cases, which are usually the result of lack of thought rather than of deliberate neglect.

A Delivery Towel for Midwifery

Mr. ERNEST B. HINDE (Norwich) writes: With reference to the articles on puerperal sepsis in the *Journal* of August 13 (pp. 331 et seq.), it occurs to me that a device which I have found most useful may be equally useful to others. It is a delivery towel. The end of an ordinary towel is turned back and sewn along the edges, so as to make a pocket about 18 inches long. This lies over the abdomen as the woman lies in the left lateral position. The towel is long enough for the other end to hang down over the buttocks. I insert my gloved hand in the pocket and can use pressure as necessary until the head is crowned. Then I withdraw my hand from the pocket and have both hands ready for the delivery of the head. I think this is much better than wrapping one's hand in a towel, which very easily, especially with a restless patient, becomes disarranged.

George III

Dr. JAMES R. WHITWELL writes: The notes of Dr. W. R. Betts on the case of George III (*Journal*, September 24, p. 664) are most interesting. I should, however, like to suggest that he pays His Majesty a compliment which was hardly deserved by saying that he was intelligent. Lecky (*History of England*) certainly does not agree, for he says, "His education was indifferent, and as an adult he was singularly deficient in literary culture." Lord Waldegrave said that he was "a boy of respectable abilities, but great constitutional indolence." J. R. Green (*Short History of the English People*) says, "He had a smaller mind than any English king before him save James II, he was wretchedly educated, and his natural powers were of the meanest sort." Dr. Thomas (Bishop of Peterborough, and his tutor) said, "He is remarkably backward, his stock of general knowledge at aet. 22 [when he ascended the throne] was very slender, he knew no Latin or Greek [most unusual at that time], he wrote English ungrammatically"; he used to swing himself to and fro when talking, and had a trick of ending his sentence with "What! what!" His taste was execrable, according to Madame D'Arblay (Diary and Letters of Miss Burney), and he regarded Shakespeare as "sad stuff."

Frederick Page of Newcastle

Professor G. GREY TURNER writes: I have been looking through some numbers of the *B.M.J.* which accumulated while I was travelling to Australia last year. In the leading article on "Spinal Tumours: A Jubilee" in your issue of July 31, 1937 (p. 220) you speak of *Herbert* Page of Newcastle-on-Tyne and of a rather unhappy prediction which he made concerning the operation of laminectomy. Herbert William Page practised in London, where he was surgeon to St. Mary's Hospital. For years he was prominent, as a railway surgeon, and wrote much on spinal injuries. The Newcastle surgeon was *Frederick* Page, also a railway surgeon; but though ready with his tongue he was reticent with the pen and wrote little.

Christmas Cards

It is not often that help for a deserving charity is forthcoming from the performance of so pleasant and individual a custom as sending greeting cards at Christmas, but this opportunity is once again provided by the Grenfell Association of Great Britain and Ireland. As last year, this association has for sale a number of specially designed Christmas cards, some in black-and-white, and one, entitled "Christmas Eve in Labrador," in full colour. Prices for these cards, which are sold in aid of Sir Wilfred Grenfell's medical work among British settlers in Labrador and Newfoundland, range from 1s. 6d. a dozen to 3s. for half a dozen. Further particulars and a leaflet showing the designs, and other gifts made by the people of Labrador, may be obtained from the Grenfell Association, 66, Victoria Street, London, S.W.1, or, in Scotland, from the Hon. Mrs. John Scott Maclay, 21, Bothwell Street, Glasgow.

A Calendar of Medical History

Warner's *Calendar of Medical History* endeavours to discover new phases in the annals of medicine that may lend fresh interest to browsing among out-of-the-way crevices of the past. The practical features have been retained in the 1939 edition, with occasional additions of modern interest. This diary will be available early in December to members of the medical profession only. Those who have found it useful and would like to receive a copy are advised to apply early to Power Road, Chiswick, W.4.